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THE SYNDROME OF GLAUCOMATO-CYCLITIC CRISES

E. B. Israel, M.B., Ch.B. (Edin.)*
St. John Ophthalmic Hospital, Johannesburg

The outstanding clinical features of this syndrome comprise recurrent attacks of increased intra-ocular tension in one (and always in the same) eye. The attacks come on suddenly, at irregular intervals and for no apparent cause. They last from one to about 21 days, rarely over 2 weeks. The patient usually complains of burning and watering of the eye, blurred vision and of seeing rainbow rings. The eye may appear only a little bloodshot or be very red and congested. Keratic precipitates may or may not be present and there may be a trace of aqueous flare. Posterior synechiae never form. In spite of numerous attacks the disc and the field of vision remain normal. Provocative glaucoma tests always give negative results.

As this clinical entity is of rare occurrence, my report on the following 2 cases, one of which has a history extending over a period of over 30 years, should prove to be of interest.

CASE REPORTS

Case 1. Mrs. F. S., a 27-year-old business woman, consulted me on 8 May 1920 because of a sudden attack of blurred vision, discomfort and watering of her left eye. It started with her seeing rainbow rings 2 days before. She had one similar attack in May 1919 and 2 this year. The attacks came on suddenly at irregular intervals and for no apparent reason. She was told by 2 ophthalmic surgeons that she had glaucoma and was advised to have an operation for it.

Examination showed conjunctival, but no ciliary injection. Slight haziness of the cornea, but no keratic precipitates. The pupil was somewhat dilated and reacted sluggishly. The disc was not easily seen, but appeared normal. The field of vision to the hand was normal. Vision was 20/100. Tension, 36 mm. Hg. The right eye was normal in all respects. Treatment consisted of pilocarpine and hot fomentations.

12 May 1920. The left eye was normal in all respects. It was white and its tension was 18 mm. Hg. Vision, 20/20. The disc was normal and the field of vision, as tested by perimetry and the Bjerrum curtain, normal.

I diagnosed the case as *recurrent unilateral ocular hypertension of a cyclitic origin.* Except for one bad tooth, a general medical examination revealed nothing abnormal. The tooth was extracted and she was free from attacks until 21 October 1921 when she got an attack similar to the one above described. The tension, however, was a little higher (40 mm. Hg) and the attack lasted 10 days. The treatment adopted was the same as for the previous attack, but I substituted dionine (2%) for the pilocarpine from the 6th day.

1 November 1921. The left eye was again normal in all respects. A provocative test with homatropine was negative.

16 February 1923. She had 2 attacks since I saw her last, they lasted only one day each. Now and for the last 2 days her left eye was bad again. It presented the same clinical features as in the previous episodes. Tension, 36 mm. Hg. Treatment included dionine, pilocarpine, hot bathing and digital massage. The pilocarpine was dropped after 5 days in favour of homatropine without any appreciable change in the symptoms or signs. The attack lasted 13 days and then the eye became normal again in all respects. Although I assured her that she did not have glaucoma and that surgery would not prevent recurrence of attacks, she decided to go overseas for advice. I gave her a detailed report with the diagnosis of hypertension due to a cyclitic syndrome.

In July 1923 Prof. Klugman of Berlin performed a very wide iridectomy on her left eye. She had another attack on 11 March 1924 and again on 31 August 1924, the latter one lasting 17 days.

A physical examination revealed a cholecystitis and her physicians treated her accordingly. She had a mild attack in August 1925 and a bad one on 3 February 1926. The worst episode took place on 31 January 1947, when the vision of the left eye was reduced to 5/100 and the tension was 42 mm. Hg. The attack lasted 10 days.

Slight attacks occurred in July and November 1947. Provocative tests (lability and water-drinking) on 21 February 1947 and 10 December 1947 were negative. In 1948 she left for America with a report from me. In New York she consulted Drs. Sacks and Pollen and they agreed with my diagnosis. Since her return to Johannesburg she has had several attacks, the last one being on 12 April 1952.

Summary. In spite of the numerous attacks it has had, the left eye remains normal in all respects. Although it has 6 diopters of astigmatism against the rule, due to a

* Honorary Ophthalmic Surgeon.

slight ectasia of the cornea at the site of the iridectomy incision, caused by some entanglement in the wound of the limbal ends of the pillars of the iris, its vision with correction is 20/20.

Case 2. E. M., an Indian salesman aged 34, was first seen on 2 February 1934 with a complaint of watering and blurred vision of his right eye. It came on suddenly 3 days before. He had 4 of these attacks during the last 3 years. They lasted from 3 to 7 days. He was told he had glaucoma, but refused surgical interference.

The right eye was congested, its pupil slightly dilated and reacted sluggishly. There was a mild aqueous flare, but no keratic precipitates were present. Vision, 20/70. Fundus, normal. Tension, 35 mm. Hg. Field of vision to perimetry, normal. The left eye was normal in all respects. Physical examination proved negative.

After 5 days' treatment with pilocarpine, hot bathing and digital massage, the eye became normal. Vision returned to 20/20 and tension to 20 mm. Hg. The disc and field of vision, tested by the Bjerrum curtain, were normal.

Diagnosis. Recurrent unilateral ocular hypertension due to a cyclitic syndrome.

5 October 1937. He has had 2 mild attacks since his last visit, but the eye became normal without any treatment. Now and for the last 4 days the right eye was sore and he could not see with it. Examination showed a very congested right eye with mild aqueous flare, but again no keratic precipitates were present. Tension, 40 mm. Hg. Vision, 20/100. Disc and field of vision, normal.

I suggested and did a paracentesis on 2 consecutive days, but the result was disappointing. The eye, however, returned to normal after another week with the treatment ordered for the 1934 episode.

17 April 1951. During the last 12 years he had 7 attacks and always in the right eye. Most of them were of a mild nature and lasted from 1 to 3 days. They came on suddenly and for no apparent reason. The last attack took place on 20 March 1951 and lasted 9 days in spite of the use of Cortisone topically. At no stage during the course of this attack was the tension higher than 36 mm. Hg, there was no aqueous flare and no keratic precipitates.

His eye, after all the attacks it has had, is now still normal in all respects. Its vision is 20/20 and tension 20 mm. Hg. The disc and field of vision are normal. Lability and water-drinking provocative tests, which were done at various times, proved negative; so also were the reports on his physical condition.

COMMENT

The long histories of these 2 cases, especially the first one, the absence of heterochromia and keratic precipitates are noteworthy. So is the recognition of the syndrome and its benign prognosis in 1920. Kraupa,[1] who in 1935 was the first to describe this rare disease entity, states that it recurs periodically in middle-aged men with angiopathic and degenerative constitution. His cases revealed keratic precipitates after the hypertension had subsided. Posner and Schlossman[2] in 1948 gave a more detailed description of this syndrome and its unilateral character. They reported 9 cases, in 3 of which there was some heterochromia, the lighter-coloured eye being affected. Keratic precipitates were seen 24 hours after the hypertension set in. They named it 'The Syndrome of Glaucomato-Cyclitic Crises' and classified it as a type of glaucoma intermediate between primary and secondary glaucoma. Whilst their label of this syndrome is indeed very appropriate, one finds it difficult, however, to agree with their classification. For, apart from the temporary hypertension, which is never very high (seldom over 40 mm. Hg), this disease does not exhibit any of the clinical features so characteristic of any type of glaucoma. Even the redness or congestive appearance of the eye is probably not due to the hypertension, but to the cyclitis itself. It is probably, if not obviously, a clinical entity *per se*. The history of recurrent unilateral attacks, the absence of any pathologic changes in the fundus or field of vision during and after the attacks, the return of normal and sometimes even subnormal tension after the attack and the negative results of provocative tests are important points in the differential diagnosis.

Perhaps a satisfactory hypothesis for this entity of unknown etiology may be an allergic angioneurosis of the ciliary body, causing (a) a sudden increase of fluid of an increased albuminous content, which the outflow channels of the eye cannot temporarily cope with, or (b) the congested and swollen ciliary body to slightly press on the base of the iris, thus partly closing the angle of the chamber, or (c) both. The reason why there are no changes in the disc or field of vision is because the hypertension is never very high and does not last long enough to damage the nerve fibres emerging from the disc. The presence or absence of keratic precipitates depends on the number of lymphocytes in the aqueous. In Case 1 no cells were at any time detected, whilst in Case 2 the aqueous flare was only very mild.

As regards treatment, surgery, as noted in Case 1 and by Kraupa[1] and Billet,[3] whose case had a trephination and an iridencleisis, does not prevent recurrence of attacks, nor has it any effect on the course of the disease. For the attack itself treatment, whether with myotics or mydriatics, does not seem to shorten the course. Kraupa[1] recommends paracentesis, and Billet[3] Cortisone, as his case got better in 5 days. Case 2 did not respond to either.

SUMMARY

Two cases presenting the syndrome of glaucomato-cyclitic crises are reported. The history of one case extends over a period of 32 years.

Mild aqueous flares were present in one case, but at no stage during the course of attacks in either case were keratic precipitates present.

Surgery does not prevent recurrence of attacks. Topical treatment does not seem to shorten the course of a crisis.

An hypothesis is advanced to account for the pathological and clinical features of this syndrome of unknown etiology and benign prognosis.

The syndrome was recognized, although not published, in 1920, under the label of recurrent unilateral ocular hypertension of a cyclitic origin.

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REFERRED PAIN IN THE EAR AND AURAL REFLEXES

L. KNOX, F.R.C.S.
Durban

The intricate anatomical recesses, cavities and fossae of the upper respiratory and alimentary tracts are so inadequately visualized, and so difficult to examine by common methods, that serious disease may arise in these areas and may be allowed to pass into the category of 'incurable' before attention is drawn to it. But Nature has provided a lode in the shape of referred pain in the ear. This is often an early symptom of deep-seated disease and, regretfully, is often ignored.

To appreciate the numerous areas which may give rise to tele-otalgia, a rudimentary knowledge of the origins of the nerve supply of both the external and the middle ear is necessary.

THE SKIN OF THE MASTOID PROCESS, THE AURICLE, THE EXTERNAL MEATUS, AND THE LATERAL SURFACE OF THE DRUM

1. The medial division of the posterior ramus of the second cervical nerve terminates as the greater occipital nerve: this gives a twig to join the lesser occipital in the mastoid area.

2. The anterior ramus of the second cervical nerve joins the cervical plexus, but its sensory fibres are largely continued through as the lesser occipital nerve, the terminal branches of which are occipital, mastoid and auricular. The auricular branch supplies the skin of the upper third of the cranial surface of the auricle, and the destination of the other two branches is obvious.

3. Sensory branches from the second and third cervical nerves, via the cervical plexus, unite to form the greater auricular nerve, with terminal mastoid, auricular and facial branches. The auricular twig supplies the lower two-thirds of the cranial surface and the lower one-third of the lateral surface of the auricle.

4. The auriculo-temporal branch of the mandibular nerve supplies the skin of the upper two-thirds of the lateral surface of the auricle, and gives off two other twigs, one of which goes to the tympanic membrane and the other to the tempero-mandibular joint. In addition the auriculo-temporal nerve effects communication with branches of the facial nerve and with the otic ganglion.

5. The auricular branch of the vagus (Arnold's nerve) arises from the jugular ganglion in the jugular foramen and, from the point of view of this paper, is probably the most important nerve to be considered. After an inter-osseous course through the temporal bone it divides into two fila; the first joins the posterior auricular branch of the facial, and the second is sensory to (a) a small area of the skin of the cranial surface of the auricle, and (b) to the posterior wall and floor of the external auditory canal. Through Arnold's nerve, a link is established with the other numerous divisions of the vagus, the important ones for the present purpose being those which arise:

i. In the jugular foramen—meningeal and pharyngeal branches;

ii. In the neck—the superior laryngeal nerve carrying sensory fibres to the larynx down as far as the vocal cords;

iii. In the thorax—the recurrent laryngeal, carrying sensory fibres to the larynx below the vocal cords, cardiac, oesophageal and bronchial, these last spreading through the substance of the lung.

THE MEDIAL ASPECT OF THE DRUM, THE MIDDLE EAR, AND THE MASTOID EAR CELLS

1. The nervus spinosus branch of the auriculo-temporal nerve traverses the foramen spinosum and supplies *inter alia* the mastoid air-cells.

2. The tympanic branch of the glossopharyngeal nerve (Jacobsen's nerve) is joined by the carotico-tympanic sympathetic fibres from the carotid plexus to form the important tympanic plexus. This plexus supplies twigs to the medial aspect of the drum, the mucous membrane of the middle-ear and the mastoid air cells, and to the outer part of the eustachian tube. The largest branch of the plexus, the lesser superficial petrosal nerve, leaves the middle ear cavity to reach the dura on the anterior surface of the temporal bone, and finally passes out of the skull via either the foramen ovale or Arnold's canal to join the otic ganglion.

Other than the important tympanic nerve, the glossopharyngeal supplies carotid branches which descend with the artery, pharyngeal branches (which join those of the same name from the vagus, the spheno-palatine ganglion, and the sympathetic, to form the pharyngeal plexus), tonsillar branches, and lingual which supply the posterior third of the tongue.

In brief it is seen that the auricle and external canal receive their sensory supply from:
(a) The upper 2 or 3 cervical nerves;
(b) From the auriculo-temporal branch of the mandibular;
(c) From the auricular branch of the vagus.

That the drum receives its supply from:
(a) The auriculo-temporal nerve;
(b) The auricular branch of the vagus;
(c) The tympanic branch of the glosso-pharyngeal.

That the middle-ear, mastoid cells and outer half of the eustachian tube receive their supply from:
(a) The tympanic branch of the glosso-pharyngeal;
(b) The nervus spinosus from the mandibular division of the trigeminal.

That the inner half of the eustachian tube receives its supply per the pharyngeal plexus from:
(a) The glossopharyngeal;
(b) The vagus;
(c) The maxillary division of the trigeminal.

Now it is a simple matter to envisage which parts of the respiratory and alimentary tracts could, when diseased, give rise to unusual sensations in the ear, and bearing in mind that the reflex arcs are biphasic, it is possible to postulate what distant symptoms might arise from undue stimulation of the ear. In the first case, pain may be referred to the ear from:

i. Caries of the upper cervical vertebra, through the upper cervical nerves.

ii. Any disease of the mandible, lower teeth, floor of the mouth or anterior two-thirds of the tongue, through the auriculo-temporal or nervous spinosum branches of the mandibular nerve.

iii. Any disease of the nose, maxillary antrum or upper teeth, through the links between the maxillary and the auriculo-temporal nerves.

iv. Any disease of the posterior third of the tongue, soft palate, naso-pharynx or pharynx, through the tympanic branch of the glosso-pharyngeal.

v. Any disease of the larynx or hypopharynx through the auricular branch of the vagus. It is in this area that the reflex is of its greatest value. Early carcinoma of these parts may be 'silent' locally, examination is difficult, but the reflex works well and persistent pain in one ear, with no detectable local cause, must always suggest a laryngoscopy. It is to be noted that the reflex stimulation of the auricular branch of the vagus may occasionally give rise to trophic changes in the skin of the external auditory canal, which lead to an eczematous type of otitis

externa. The trap is obvious: the persistent pain in the ear may be wrongly attributed to the local dermatitis, and valuable time may be lost in applying topical medicaments. Thus a persistent, painful, unilateral, eczematous otitis externa arising in a patient of carcinoma age should indicate an examination of the larynx.

vi. Theoretically any disease of the lung, through the bronchial and auricular branches of the vagus, could engender pain in the ear, but this is not a common finding. I wish, however, to draw particular attention to pain in the ear as a presenting symptom of carcinoma of the lung. No reference can be found in the literature to this, but two such cases, both inoperable, have been seen.

vii. Angina pectoris has many guises and through the cardiac and auricular branches of the vagus, it may appear as a circum-aural pain.

viii. Any disease of the oesophagus, particularly an oesophagitis from any cause, through the oesophageal and auricular branches of the vagus, may add an aural component to the substernal discomfort or pain, but such a component is more likely to be the peripheral extension of a radiating pain from the substernal regions than a localized otalgia.

ix. The only diseases of the gastric cardia in which the reflex has been noted are severe indigestion, peptic ulcer and advanced carcinoma. Here again the pain is a wave which reaches as far as the ear, and not a detached otalgia.

Of the reverse reflexes, the cough which arises from interference with the external auditory meatus, is commonplace, but it is perhaps not so well known that a moving foreign body, particularly in a child, may give rise to chronic spasms of coughing. In children, also, cleaning of the meatus may lead to vomiting. In the adult, fainting during cleaning the external canal is a relatively common experience to any otologist. In 6 consecutive cases of fainting occurring in the author's practice, 4 were associated with simple aural toilet. One woman aged 28, from whose external canal a plug of wax was being removed with an aural hook, felt dizzy and almost immediately fell from her chair to the floor, deeply unconscious. Her respirations became stertorous, her body stiff, and the radial pulse could not be felt. After about 2 minutes the pulse returned to the wrist, and consciousness was regained, but it was some 20 minutes before she was well enough to sit up.

In the elderly, fatal cases have been recorded from aural syringing.

This reverse reflex is easily suppressed, because even in the non-atropinized, lightly anaesthetized patient, no change in the quality or rate of the pulse has been noted during surgical manoeuvres on the external canal or drum.

SUMMARY

Attention is drawn to the phenomenon of pain referred to the ear from distant lesions.

The various nervous arcs through which the reflex may be transmitted are indicated briefly.

The great value of this reflex as an index of hidden disease is not sufficiently appreciated and a plea is made for a thorough ear, nose and throat examination in any case of persistent unilateral otalgia.

Referred pain in the ear may be a rare presenting symptom of carcinoma of the lung.

Stimuli may pass with facility in either direction through that particular reflex arc consisting of branches of the vagus so that while lesions in the areas supplied by the vagus may give rise to pain in the ear, conversely, any fret of the external auditory canal may initiate a cough, nausea, or even changes in cardiac rhythm.

ABSTRACTS

C. A. Lemaistre, R. Tompsett, C. Muschenheim and Others: *Effects of Adrenocorticotropic Hormone and Cortisone in Patients with Tuberculosis.* (*Journ. Clin. Invest.*, Vol. 30, May 1951, p. 445.)

The authors observed that the administration of adrenocorticotropic hormone and cortisone to patients suffering from various diseases caused a lower body temperature, decrease in oedema and inflammation, changes in antibody production, and the degree of hypersensitivity to bacterial products. Seven patients with far-advanced pulmonary tuberculosis were selected for an experiment.

Tubercle bacilli, isolated from the sputum of four of the patients, were highly resistent to streptomycin *in vitro*, and remained so throughout the study. Four patients received adrenocorticotropic hormone 100 mg. intramuscularly 4 times a day for 10 days; 3 patients received cortisone in the same dosage schedule.

Five patients showed a marked amelioration of all symptoms 6 to 8 hours after the initial dose of either hormone; when the administration of hormone was discontinued all signs and symptoms reappeared. Defervescence was accompanied by a feeling of increased strength and a desire for physical activity; appetite increased, causing an increased intake of calories and proteins. Dyspnoea and cough no longer caused discomfort, although the volume of sputum did not alter. Serial roentgenograms showed consistent changes in 5 patients; the lung lesions became more translucent. Serum gamma globulin which was markedly elevated in 7 patients, was decreased toward normal during the 10-day period of hormone therapy. Repeated tests of skin hypersensitivity were made; in 3 patients cutaneous hypersensitivity was reversed, i.e. from positive to negative.

The abrupt, temporary disappearance of the manifestations of tuberculosis induced by adrenocorticotropic hormone and cortisone is very interesting, but further study is necessary regarding these temporary changes in a chronic infection.

A. Colaço Belmonte (1951): *Night Cramps and Intermittent Claudication.* Nederl. Tydschr. v. Geneesk., **95**, 1193–7.

Moss and Herrmann (1940, 1948) described the beneficial action of quinine in muscle cramps, especially those of the lower extremities, which occur in elderly people, pregnant women, sufferers from varicose veins, etc. Many doctors are glad to corroborate the experience of Moss and Herrmann, amongst them the Dutch orthopaedist Colaço Belmonte who read a paper on night cramps and intermittent claudication to the Dutch Orthopaedic Society. As regards the muscle cramps, restless legs, etc., in such conditions he stated: It is a fact that quinine is a very valuable drug in the treatment of these cramps. I witnessed its use by American military surgeons in the Far East in many of the muscular disturbances in overfatigued soldiers and physically exhausted prisoners-of-war. Ever since, I have prescribed quinine to patients with night cramps as a routine measure (200 mg. quinine sulphate, three times a day) and success was nearly always uniformly good.

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EDITORIAL

ACTH AND THE THYMUS

In 1948 Soffer *et al.*[1] reported on the favourable effect of ACTH in a case of myasthenia gravis associated with a tumour of the thymus gland. At that time very limited amounts of ACTH were available, and although the patient was treated with only 40 mg. of ACTH daily for 4 days, the result was a definite decrease in the size of the thymus with a subsequent improvement in the myasthenic condition. In 1949 Torda and Wolff[2] confirmed the beneficial effects of ACTH in myasthenia gravis without an associated enlargement of the thymus gland, but Shy *et al.*[3] were unable to note either diminution in the mass of the thymic tumour or improvement in the clinical condition of a patient with symptoms of myasthenia gravis treated with Cortisone. It does not, of course, follow endocrinologically that the beneficial effect observed in myasthenia gravis after ACTH treatment is due to Cortisone. If the improvement was significant and due to the ACTH used, it may we'l have been that some other steroid from the adrenal cortex was released by the ACTH injected.

More recently additional information on the relation of ACTH to thymic masses has been provided by Soffer, Gabrilove and Wolf.[4] In 5 patients with enlarged thymus glands intramuscular treatment with ACTH showed, in certain cases, a striking decrease in the size of the mass. In a case of malignant thymoma, the decrease in mass occurred also after Cortisone, and there was a radiological suggestion of temporary shrinkage of metastases in the pleura after ACTH. In 3 of the 5 cases reported on, the diminution of the thymic mass is reported as 'significant', although not as striking as in the other 2 cases.

These clinical and experimental observations (particularly as they can be related to thymectomy in the surgical treatment of myasthenia gravis) open up an extremely interesting and valuable field for investigation. Indeed, the close relationship which is recognized today between the adrenal glands and vital bodily functions, makes it desirable to undertake a re-assessment of the much abused and much disputed syndrome of status thymico-lymphaticus. In the light of the enormous amount of work done since Selye introduced his concept of the general adaptation syndrome (and the importance of the adrenal cortex in this connexion) there may well be need for a revised attitude on the part of those who doubt the validity of the claims made for status thymico-lymphaticus.

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VAN DIE REDAKSIE

ACTH EN DIE TIMUSKLIER

In 1948 het Soffer *et al.*[1] gerapporteer oor die gunstige uitwerking van ACTH in 'n geval van myasthenia gravis gepaard met 'n timuskliergewas. Op daardie tydstip was baie beperkte hoeveelhede ACTH beskikbaar, en hoewel die pasiënt slegs met 40 mg. ACTH daagliks vir 4 dae behandel is, was die resultaat 'n definitiewe afname in die grootte van die timusklier met 'n uiteindelike verbetering van die spierswakte-toestand. In 1949 het Torda en Wolff[2] die heilsame uitwerking van ACTH by myasthenia gravis sonder meegaande vergroting van die timusklier bevestig, maar Shy *et al.*[3] was nie in staat om òf 'n vermindering van die timusgewasmassa òf 'n verbetering in die kliniese toestand op te merk nie in 'n geval van 'n pasiënt met simptome van myasthenia gravis wat met Kortisoon behandel is. Dit volg natuurlik nie endokrinologies dat die heilsame uitwerking wat opgemerk is by myasthenia gravis na behandeling met ACTH aan Kortisoon toe te skrywe is nie. As die verbetering van betekenis was en aan die ACTH wat gebruik is toe te skrywe is, kon dit wel gewees het dat een of ander steroïde van die bynierskors deur die ingespuite ACTH vrygelaat was.

Later is addisionele inligting oor die verband tussen ACTH en timiese massas deur Soffer, Gabrilove en Wolff[4] verstrek. By 5 pasiënte met vergroote timuskliere het binne-spierse behandeling met ACTH, in sekere gevalle, 'n aanmerklike afname van die grootte van die massa getoon. By 'n geval van kwaadaardige timoom het die vermindering van die massa ook na behandeling met Kortisoon voorgekom, en daar was 'n radiologiese aanduiding van tydelike inkrimping van metastase in die borsvlies na behandeling met ACTH. By 3 van die 5 gevalle waaroor verslag gedoen is, word die vermindering van die timiese massa as ‚belangwekkend' gerapporteer, hoewel nie so aanmerklik as by die ander 2 gevalle nie.

Hierdie kliniese en eksperimentele waarnemings (veral omdat hulle in verband gebring kan word met timektomie by die chirurgiese behandeling van myasthenia gravis) lê 'n uiters interessante en waardevolle gebied vir ondersoek bloot. Inderdaad maak die noue verwantskap tussen die bynierkliere en lewensbelangrike liggaamsfunksies wat vandag erken word dit wenslik om die baie misbruikte en baie betwisde sindroom van *status thymico-lymphaticus* te herskat. In die lig van die enorme hoeveelheid werk wat gedoen is sedert Selye sy begrip van die algemene aanpassingssindroom ingevoer het (en die belangrikheid van die bynierskors in hierdie verband) mag daar wel noodsaaklikheid bestaan vir 'n hersiende houding aan die kant van diegene wat die geldigheid van *status thymico-lymphaticus* in twyfel trek.

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SAFETY IN THE USE OF MUSCULAR RELAXANTS

K. B. VETTEN, M.B., B.S. (RAND), D.A. (RAND)

J. C. NICHOLSON, M.B., B.S., F.F.A.R.C.S., D.A. (ENG.)

and

D. C. DEVITT, M.R.C.S., L.R.C.P., D.A. (ENG.)

Johannesburg Hospital, Johannesburg

So profound have been the changes in the practice of anaesthesia brought about by the introduction of muscular relaxants, and so rapid the progress of surgery in the last decade, that it seems difficult to believe that less than 10 years ago these drugs were practically unknown to the anaesthetist.

Besides producing relaxation of the abdominal musculature and depressing reflex response without resort to very deep anaesthesia, thus lengthening the operating time available in poor-risk patients, muscular relaxants have conferred other advantages which neither surgeon nor anaesthetist would now willingly forego. To mention but a few of the more important of these advantages, we have their use in securing satisfactory controlled respiration in thoracic surgery without excessive doses of centrally acting respiratory depressants and they are particularly valuable where inflammable agents have to be ruled out and the anaesthetist has to depend largely on intravenous methods for long periods. In these circumstances the judicious use of muscular relaxants often enables the anaesthetic to be spared to such an extent that the chance of serious post-operative depression is greatly reduced. Muscular relaxants are also invaluable for facilitating such procedures as bronchoscopy without the use of explosive gases or vapours. Their use as an aid to intubation is also frequently mentioned, but this is better regarded as a convenience than a major advantage.

The use of peripherally acting drugs to obtain these effects is logical, as the nature of their action tends to minimize toxic side-effects. A much more pleasant post-operative period with fewer complications is to be expected than if relaxation is obtained by the excessive use of a centrally acting anaesthetic agent.

PRINCIPLES

Dangers in the Use of Muscular Relaxants. The use of muscular relaxants complicates the anaesthetic and can be dangerous if due regard is not paid to certain safety principles. A thorough understanding of controlled respiration is a *sine qua non* to anyone employing them but there are other important points which must be appreciated.

The excessive and prolonged depression which may arise from overdose or hypersensitivity is the chief danger, and if this condition is complicated by the effects of anoxia it may become irreversible. It is usually a simple matter for an experienced anaesthetist to avoid such a contingency, but the dose must be carefully considered with relation to the anaesthetic and the possibility of serious deterioration in the patient's condition from other causes has to be taken into account.

True idiosyncrasy among muscular relaxants is rare although it has been reported[1]; but varying degrees of hyper- and hypo-sensitivity occur more frequently, and are discussed in a recent paper by Dundee and Gray.[2] The availability of a good antidote is so important that we are inclined to regard it as an absolute necessity, but it is very undesirable that muscular relaxants should be used in such a way that an antidote is required almost as a matter of routine. Such crude technique, comparable to 'driving on the brakes', is bound to lead the anaesthetist into trouble sooner or later. On the other hand, the antidote should never be withheld if it is necessary and no patient should ever leave the theatre without full and efficient action of his respiratory muscles.

Cumulative action is another factor. The longer-acting drugs such as a *d*-tubocurarine are certainly cumulative up to a point, though less so than Thiopentone. Clinically the position is always complicated by the use of other drugs, which may potentiate the effects of the relaxant.

BALANCE BETWEEN THE RELAXANT AND THE ANAESTHETIC

The safe and efficient use of muscular relaxants calls for a correct balance between the relaxant and anaesthetic which often requires both judgment and experience on the part of the anaesthetist.

If the anaesthesia is too light:

(a) Excessive doses of the relaxant will be required with an increased possibility of overdose.

(b) Unsatisfactory operating conditions with poor and uneven relaxation may be present.

(c) Incomplete anaesthesia may contribute to the early development of shock.

On the other hand, excessively deep anaesthesia may result in dangerous respiratory depression which is particularly undesirable where large amounts of anaesthetic have to be eliminated via the lungs.

The nature of the anaesthetic is important as well as the depth. Most of the commonly used anaesthetic agents can be employed with muscular relaxants, but some are more suitable than others.

Of the inhalation agents, the gaseous anaesthetics have much to commend them on account of their flexibility, which is an important safety factor. *Nitrous oxide*, provided it is at all times used with sufficient oxygen, would

be ideal except for its low potency, but it is usually necessary to supplement it with thiopentone, pethidine or ether.

Cyclopropane is an excellent anaesthetic in many ways as it is both flexible and possessed of adequate potency. Its inflammability and the necessity of employing a closed circuit impose some limits on its usefulness; and some anaesthetists prefer not to use it continuously over prolonged periods. We have found it particularly valuable for the rapid deepening of anaesthesia at the end of an operation to facilitate the closure of the peritoneum. This reduces, or even dispenses with, the dose of relaxant which might overwise be required.

Ether is satisfactory, provided the amount used is limited and the level of anaesthesia is not taken below the second plane. Muscular relaxants are dangerous if used in conjuction with deep ether anaesthesia.

Trichlorethylene is sometimes employed when an inflammable agent cannot be used. Even more than ether, it must be sparingly used.

Intravenous Anaesthesia. The two agents most commonly used by this route are thiopentone and pethidine. While the combination of a central and a peripheral respiratory depressant has certain theoretical disadvantages, it is found in practice that excellent results are obtained by their skilful combination with muscular relaxants.

Thiopentone. The use of a muscular relaxant with this drug enables much better results to be obtained with smaller amounts and results in a quicker recovery with less post-operative respiratory depression. So marked is this effect that Gray,[3] in his earlier work, comments strongly on the synergism between thiopentone and *d*-tubocurarine. In later work Gray *et al.*[4] failed to demonstrate any prolongation in action time when thiopentone was supplemented with curare, the duration of anaesthesia in some cases being actually shorter; but whether or not synergism in its strict pharmacological sense exists between them, there is no doubt that, under clinical conditions, a little thiopentone goes much further if combined judiciously with a muscular relaxant. Where thiopentone is used it is necessary to consider the possible cumulative effect of a large over-all dose, and in long operations the total dose should be limited. It is also wise to give the thiopentone mainly during the earlier part of the operation and, if possible, rely on inhalation anaesthesia in the crossing stages.

Pethidine. This is a drug which has recently come into prominence as an adjuvant to anaesthesia. It cannot be given safely so as to produce narcotic effects comparable to those obtained with thiopentone, but it has a good analgesic effect and its action is more prolonged. Sensitivity is known to occur and very large doses should be avoided as they lead to residual respiratory depression. There seems, however, to be a definite reduction in metabolic rate, for the colour usually remains good.

CONTRAST IN THE ACTION OF MUSCULAR RELAXANTS IN CLINICAL PRACTICE

In simple cases the impression is easily gained that there is little difference in the action of the various commonly used muscular relaxants. Here, however, the anaesthetic itself probably goes a long way towards satisfying the surgical requirements. Under more exacting conditions, particularly in upper abdominal surgery, the contrast between the action of different agents is more apparent.

It is our experience that *d*-tubocurarine can be used to advantage in abdominal surgery with a lighter plane of anaesthesia than any other agent we have so far tried. Its properties, which seem important in conducing to this end, are:

(a) Stability of the neuro-muscular block.
(b) Its effect is relatively prolonged.
(c) The wearing off is gradual.

Relaxants which have an action of shorter duration, and whose effect wears off more abruptly, require rather deeper anaesthesia for smooth and satisfactory operating conditions and at the same time can usually be more safely employed with deeper anaesthesia and with agents such as ether. We have previously commented on the contrast between the action of *d*-tubocurarine and decamethonium iodide,[5] and other agents have, to a greater or lesser extent, shown the same type of contrast.

In the light of the foregoing, we shall briefly review our experiences over the past two years with some of the more commonly used relaxants.

Decamethonium Iodide (*C* 10). In a study of this drug made 2½ years ago, on a relatively small series of cases (223), we found an interesting contrast between the action of decamethonium iodide and *d*-tubocurarine.[5] We were also of the opinion that decamethonium had a useful place in anaesthesia and had a sufficiently wide margin of safety to compensate for the absence of a reliable antidote. Definite conclusions concerning the safety of a drug can, however, only be reached after the analysis of many thousands of cases from all available sources and it is essential that failures and complications, particularly of a dangerous nature, should be frankly reported when they occur. The need for such caution is well illustrated by a case which occurred in the hands of one of us (J.C.N.) not long after our previous paper had gone to press. We feel it is advisable to report this case in full.

CASE REPORT

The patient was a man of 44, of spare wiry build and weighing about 120 lb. He was of nervous disposition and had lost a considerable amount of weight but otherwise appeared quite healthy. He was suffering from a duodenal ulcer of long standing but apart from this there was nothing of significance in his medical history.

The cardio-vascular system appeared normal; pulse rate, 80 per minute; blood pressure, 120/80 mm. Hg. and haemoglobin 15 gm. %.

The lungs showed a few scattered rhonchi on both sides, but there was no dullness and respiratory movements and air entry were satisfactory.

Urine was normal and the blood urea was 43 mg. per 100 c.c. He was submitted for a bilateral vagotomy and was assessed as a good surgical risk for this operation. Premedication, consisting of Omnopon gr. 1/3 and Scopolamine gr. 1/150, was given 1½ hours before operation. Anaesthesia was induced with thiopentone (0.5 gm.) and maintained with nitrous oxide, oxygen and minimal ether given with a Boyle's apparatus. Relaxation was maintained by injecting fractional doses of decamethonium iodide as required. The initial dose of 4 mg. was given a few minutes before opening the peritoneum. This caused apnoea for 5 minutes and required assisted respiration for 12 minutes. Half an hour later a further 2 mg. was given and on this occasion respiration

remained adequate without assistance. After a further 30 minutes the patient was noticed to be straining slightly and the 2-mg. dose was repeated. Satisfactory relaxation ensued and again no assistance of respiration was required.

Fifty minutes later, when the surgeon was about to close the abdomen, another 2 mg. of decamethonium iodide was given. At first the surgeon complained that the abdominal muscles were too tight and the anaesthetist was about to give a further dose; noticing, however, that the respiration had become very shallow, he asked the surgeon to wait, and a few minutes later the peritoneum was closed without difficulty. The respiration, however, remained shallow and finally ceased altogether.

At the close of the operation, which lasted 2½ hours, the patient was removed to the anaesthetic room where pulmonary ventilation was maintained with oxygen, using intermittent positive pressure. When spontaneous respiration showed no sign of returning after half an hour, full doses of nikethamide and later pentamethonium iodide were given without result. Colour and pulse remained satisfactory but the pupils were dilated. Three hours after the operation there was still no improvement so the patient was put into an 'iron lung' and oxygen was administered simultaneously through an endotracheal tube. Within an hour there were signs of returning consciousness, muscular tone and movement and when, 20 minutes later, the respirator was stopped, respiratory action remained sufficient for it to be discontinued. The colour and peripheral circulation remained good though the blood pressure had fallen to 70/40 mm. Hg as a result of the double dose of pentamethonium iodide. Next morning the blood pressure was again normal and the convalescence was remarkably uneventful. The only remaining disability following this alarming episode was a slight corneal opacity in the left eye.

Two years later the patient was again admitted for a gastro-enterostomy. His condition did not differ appreciably from that on the first occasion and he was given the same premedication. The anaesthetic technique differed from that previously employed largely because diathermy was used throughout the greater part of the operation. Induction was with thiopentone (0.5 gm.), and ether was used for the first 10 minutes. Thereafter anaesthesia was maintained with nitrous oxide and intermittent trilene, and pethidine (40 mg.) were given. At the beginning of the operation the patient received 10 mg. of *d*-tubocurarine. The dose was not repeated and closure of the peritoneum was facilitated by deepening the anaesthesia with cyclopropane. The duration of the operation was 1½ hours.

The anaesthetist (D. C. D.), who was aware of what had happened on the previous occasion, reported that respiration had shown an exaggerated response to *d*-tubocurarine and had a tendency to become Cheyne-Stokes in character. Frequent assistance was required and he was also of the opinion that there was some degree of sensitivity to the Omnopon premedication. There were, however, no serious complications.

We do not feel entitled to regard this case as one of idiosyncrasy to decamethonium iodide, particularly in view of the abnormal respiratory reactions on the second occasion when curare was used and it was possible that other drugs, such as Omnopon, were implicated. At the same time, we must bear in mind that in clinical practice relaxants are never used alone and it is with complexities of their reactions in conjunction with the other components of the anaesthetic that we are directly concerned. One must always be wary of accepting too literally properties based on work under controlled conditions and the need for caution is always present. Points which require special emphasis are:

(a) The reaction of the patient to each of the first 3 doses of decamethonium iodide was not abnormal. The alarming sequelae to the final injection could not, therefore, have been foreseen or avoided by a test dose.

(b) The sequence of events seems to suggest a cumulative effect which was particularly disturbing as our previous experience of decamethonium iodide had indicated that it was singularly free from this disadvantage and that, if large doses were required (which was frequently the case) they could be given with safety.

(c) There was nothing to suggest an overdose. The abdominal muscles were tight before the administration and the dose given had often failed to produce the desired relaxation on previous similar occasions.

(d) The method of anaesthesia was one which we had found safe and satisfactory with decamethonium iodide and which we have continued to use with satisfaction with other relaxants.

Decamethonium differs in its action from *d*-tubocurarine and gallamine triethiodide in producing a neuro-muscular block by depolarization, whereas the two latter drugs *prevent* depolarization at the end plate.[6] Dundee and Gray[2] have shown that a case of myasthenia gravis, hypersensitive to *d*-tubocurarine, reacted normally to decamethonium iodide. This condition, however, hardly offers a clinical field for the use of any kind of relaxant and the foregoing case, as well as other reports which have reached us, compelled us to alter our views on its safety. In the absence of a satisfactory antidote we saw no good reason for continuing to use it.

Gallamine Triethiodide (Flaxedil)

A clinical trial of this drug, along the same lines as those adopted for decamethonium iodide, was undertaken at the same time; and during the past 3 years Flaxedil has been administered to well over 3,000 patients at the European branches of the hospital alone. Its use has covered the entire range of surgery where muscular relaxants are applicable and, up to the present, very few serious complications attributable to its use have been observed.

In normal dosage the effect of Flaxedil usually lasts considerably longer and wears off more slowly than is the case with decamethonium iodide and satisfactory conditions for upper abdominal surgery are usually realized with lighter anaesthesia. Compared with *d*-tubocurarine, on the other hand, we found that better results were usually obtained when the anaesthetic took rather a larger share. For upper abdominal procedures the following technique has given very good results.

A thiopentone induction is followed by stabilizing the anaesthesia in the second plane with either nitrous oxide and ether or cyclopropane. In the average case 40 mg. of Flaxedil is then given a few minutes before the peritoneum is opened and further fractions, never exceeding 20 mg. at a time, as required. After the operation has been in progress for some little time the anaesthesia may be lightened as much as the anaesthetist thinks desirable. It is seldom necessary to assist respiration for more than a few minutes at a time unless the patient is deliberately hyperventilated. Usually adequate spontaneous breathing is present throughout. In the majority of cases 80 mg. of Flaxedil (or less) suffices for an operation lasting 1½–2 hours. For suturing the peritoneum the use of a small dose of Flaxedil (10 mg.), at the same time deepening the anaesthesia with cyclopropane, is better than relying entirely on the relaxant. Stabilizing the anaesthesia before giving any relaxant gives a clearer picture of the relative parts played by the anaesthetic and relaxant, which conduces to a better balance between the two and is also especially valuable in teaching. It usually more than compensates the anaesthetist for spending a little more time on the induction and foregoing the advantages that the relaxant can confer as an aid to rapid intubation.

In thoracic surgery, on the other hand, where the relaxant is used to assist the maintenance of controlled breathing, large doses of Flaxedil may be required and we have used more than

300 mg. without getting really satisfactory results. For this type of work we prefer *d*-tubocurarine and the same applies to abdominal operations where ether and cyclopropane have to be excluded.

Complications. There have been very few complications sufficient to give rise to anxiety and though, like every other drug, Flaxedil has some disadvantages, these do not appear to be of a serious nature.

Spasm is a rare complication and we have only encountered it once where Flaxedil was clearly indicated. A woman of 47 with a carcinoma of the thyroid went into violent spasm after the administration of 40 mg. of Flaxedil and before any thiopentone had been given. She became grey with a poor pulse and a difficult emergency intubation had to be undertaken. She recovered slowly when oxygen was administered but it was some time before the lungs could be inflated easily. In view of the nature of the case it was possible that there were other contributing factors but there was no sign of respiratory obstruction beforehand.

Tachycardia has been mentioned by a number of writers.[7, 8] We have noticed that patients operated on usually seem to have faster pulse rates with Flaxedil than when *d*-tubocurarine is used, but this is not necessarily due to a direct action of the drug and stimuli from the operation have to be considered. It is seldom that the rise in pulse rate is sufficient to cause anxiety, though it may render any assessment of clinical shock more difficult. In one case of pancreatic cyst the rate rose to 180 per minute.

Hiccough is sometimes troublesome but also occurs with other relaxants and is not infrequent with thiopentone anaesthesia. It is also seen in various pathological conditions of the upper abdomen and is often initiated by traction of the stomach or oesophagus. We do not particularly associate it with Flaxedil.

Pallor, which is mentioned by Wilson and Gordon,[9] is quite often seen with Flaxedil and other muscular relaxants. Its onset may be delayed, often appearing after the patient has been returned to the ward. It also seems to be affected by gravity, appearing first on the least dependent parts, an effect which has been noticed with hexamethonium bromide. With the relaxants, however, there are no significant blood pressure changes.

Variability in action was less in evidence than with most other muscular relaxants. We had 2 cases where respiration has to be assisted for more than 20 minutes following a small dose. Both occurred in gynaecological cases in the Trendelenburg position. There are, however, a number of cases of hypersensitivity to Flaxedil reported in the literature,[6] and Dundee and Gray discuss the factors concerned in hyper- and hypo-sensitivity to Flaxedil and other relaxants.[2] The method of stabilizing the anaesthetic and using the relaxant in minimal doses throughout, probably helps to avoid the more serious manifestations of hypersensitivity.

In summarizing our views on Flaxedil, however, we may say that, up to date, we have found it to be one of the safest and most dependable relaxants. Less potent in clinical dosage than curare, it is a safer drug in the hands of the trainee anaesthetist and there is less chance of producing prolonged or dangerous respiratory depression even with the slightly excessive use of ether. When skilfully employed excellent results can be obtained with an early return to full consciousness.

DIMETHYLTUBOCURARINE IODIDE (D.M.E.) AND *d*-TUBOCURARINE-DIMETHYL ETHER CHLORIDE (MECOSTRIN)

In a small series of cases we found that these drugs tended to have a variable and unreliable action. Large doses often had to be given to produce an abdomen acceptable to the surgeon. Even then relaxation was often transient and sometimes prolonged respiratory depression occurred. In view of these disadvantages and the existence of other more reliable relaxants we did not think it profitable to continue their trial.

ULTRA-SHORT-ACTING MUSCULAR RELAXANTS

More recently muscular relaxants having an ultra-short action have been introduced. These drugs present new possibilities for cases where profound relaxation is required for a very short time and may help to solve the problem of closure of the peritoneum.

The safety and efficiency of 3 of the agents succinylcholine chloride (Scoline) and Brevidil M (bis (2-dimethylamino ethyl)-succinate bismuth-iodide) and Brevidil E (bis β-dimethylaminoethyl)-succinate bisethiodide is being investigated at present, but as we have only tried the drugs on about 60 cases our experience is still far too limited to make comment. They are, however, interesting in so far as they have a different scope to the relaxants in common use.

CONCLUSIONS

We have discussed our experiences over the past 3 years with a number of muscular relaxants with special reference to the factors which make for safety and efficiency in their use.

The employment of decamethonium iodide has been discontinued on account of a puzzling case of grave hypersensitivity and the absence of a satisfactory antidote. We have, however, had consistently satisfactory results with Flaxedil in a large series of cases.

It is clearly evident that while the muscular relaxants are of outstanding value, they must be used with care and discrimination, and if they are to add to the safety of the patient as well as the convenience of the surgeon and anaesthetist, a thorough knowledge of their effects and potential dangers is necessary.

We strongly advise the occasional anaesthetist to avoid these drugs, unless he has had special training in their use.

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AN EAR OXIMETER

NOTE ON THEORY AND CONSTRUCTION *

CECIL S. JONES, M.B., CH.B.†
Department of Anaesthesia, Addington Hospital, Durban
and
K. A. W. PATERSON, B.SC.‡

The fact that the degree of transmission of light through human tissues varies according to the nature of the tissue has long been made use of clinically, e.g. in the diagnostic transillumination of swellings. By the use of suitable filters to limit the wave length of transmitted light, and of photo-electric devices to detect and measure the degree of light transmission, an old clinical method can be modernized on a scientific footing with a corresponding increase in its accuracy and value.

The interpretation of alterations in light intensity by the eye carries a moderately high and variable error as the Weber-Feuchner§ Law readily explains; but within their working range the output of certain photo-sensitive electrical devices is almost linear, for linear increases in light transmission. This is one characteristic of iron-selenium cells, which will give current in the close circuit when they are excited by light. The physical dimensions of these cells are such that they can be incorporated in a capsule which will fit snugly behind the average human ear pinna. If a light source is adjusted over the outer surface of the pinna and the light directed through the pinna so that it falls upon the photo-electric cell, the latter will measure the intensity of the transmitted light. By shielding a cell with an appropriate filter, only light of a selected wave length will be measured. This principle is made use of in the various forms of ear oximeter which have been developed in the last 20 years to measure the oxygen saturation of arterial blood.

Originally such oximeters merely recorded alterations in the transmission of red light and were by no means accurate, as light transmission is a function of the total volume of blood circulating through the light pathway. To overcome this difficulty Millikan [1] introduced the use of 2 selective filters, one in the 'red' and one in the 'green' region of the spectrum.

This immensely improved the accuracy of oximeter determinations, but his instrument, being pre-set to an estimated normal reading for the subject, measures only the direction and extent of changes in oxygen saturation, and is not capable of being used for absolute determinations of arterial oxygen saturation. The transmission of 'red' light is a function of the available oxyhaemoglobin while 'green' light is absorbed almost equally by both oxygenated and reduced haemoglobin. Wood and Geraci [2] point out, however, that blood absorbs appreciable quantities of light in the 'green' band used by Millikan and that the operative band of his 'green' filter is in the region of 800 millimicrons only. They have accordingly substituted in their oximeter a filter which transmits only at this wave length.

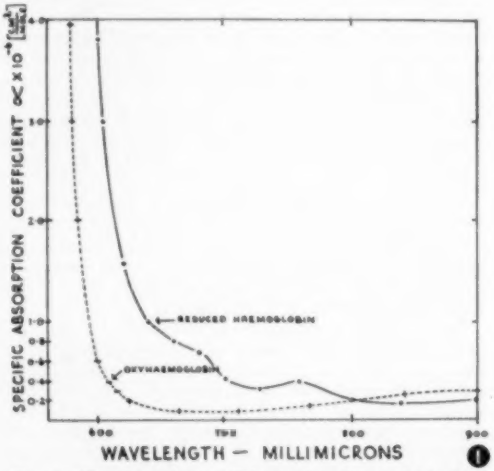

Fig. 1. The absorption coefficients of oxyhaemoglobin and reduced haemoglobin. (From the data of Hôrecker.[3])

Reference to the absorption coefficients (from Hôrecker [3]) shown in Fig. 1 will demonstrate that at 800 millimicrons the absorption of light by oxygenated and reduced haemoglobin is equal, while in the range 600-750 millimicrons ('red' region of the spectrum) these two states of haemoglobin have different absorption coefficients. Thus with alterations in circulating blood volume, light transmission will be affected in both 'red' and 'infra-red' regions but the change will be in the same direction and of the same relative magnitude for both bands, whereas with changes in oxygen saturation the 'infra-red' absorption will be unaffected while the 'red' absorption will be a function of the change in oxygen saturation.

Wood and Geraci [2] have also incorporated in their oximeter earpiece a pressure capsule which, when inflated to a pressure value in excess of the systolic blood pressure,

* Construction was aided by grants from Mr. John Anderson of Messrs. Robertsons, Ltd., Durban, and Drs. N. Sacks and E. Holmes, Department of Radiology, Addington Hospital.

† Senior Medical Officer (Anaesthetics), Addington Hospital.
‡ African Explosives and Chemical Industries, Umbogintwini, Natal.

§ *Weber-Feuchner Law*: If $\triangle S$ represents the just perceptible difference in light perception, I represents the preceding light intensity and $\triangle I$ represents the added intensity then:

$$\triangle S = K\frac{\triangle I}{I}, \text{ where K is a constant.}$$

This relationship is approximately true only at moderate light intensities.

compresses that portion of the ear interspersed between light source and photo-cell. This compression expresses the normal blood content of the ear tissue and values for light transmission during this manoeuvre give the absorption of light by the ear tissue alone. When the capsule is deflated, light absorption is effected by ear tissue and blood, and corrected light transmission data can be obtained which are functions of the ear blood alone. Thus by compensating for light transmission changes due to alterations in circulating blood volume and correcting for absorption by tissues other than blood, Wood and Geraci are able to determine light transmission changes which are due to alterations in oxygen saturation and able also to determine direct values for the degree of arterial oxygen saturation.

Two sources of error in the oximeter should be mentioned here.

i. Alterations in the light output by the light source will be followed by alterations in the output of the photo-electric cells. The current supplied to the light source should therefore be held as steady as possible.

ii. The oximeter earpiece measures the mean oxygen saturation of the blood contained in that portion of the pinna which is interspersed between light source and photo-electric cell. Ordinarily this blood will be in part oxygenated arterial and arteriolar and in part reduced capillary and venous blood. If the light source is used also as a heat source, the vasomotor dilatation consequent upon heating the pinna leads to a greatly increased and accelerated blood flow through the heated ear tissue. As a result the mean oxygen saturation of this ear tissue blood can be made to approach very nearly to that of true arterial blood. This second source of error is further minimized, though not entirely eliminated, by constructing a calibration curve in which oximeter readings are plotted against the oxygen saturation values determined by van Slyke analysis of arterial blood samples.[4] Such a curve can be used to give absolute values for arterial oxygen saturations, an advantage which earlier oximeters lack. Wood and Geraci [2] have reduced the standard error of their method to ±2.5%.

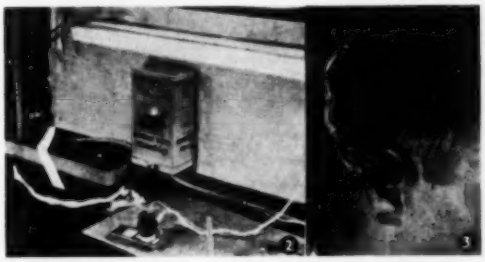

Fig. 2. A general view of the oximeter earpiece, the controls, the galvanometer box face and the apparatus for inflating the oximeter earpiece.
Fig. 3. The earpiece of the oximeter in place on the pinna.

In this preliminary report some details are given of a modified oximeter (Fig. 2) based upon the Wood oximeter, which we have constructed for research into arterial oxygen saturation changes during anaesthesia. The oximeter consists of an earpiece (Fig. 3) fashioned of Lucite and rendered opaque to light except for the small window over the iron-selenium photo-emmisive cells. The light source housing acts as a pressure capsule, the open end being covered by a thin rubber membrane to render it air-tight. The outputs from the 'red' and 'infra-red' photo-cells are adjusted by potentiometers and recorded by a taut-suspension, moving coil galvanometer with optical amplification. Ideally each photo-electric cell should have its own recording galvanometer, but for reasons of economy we use a single galvanometer and switch it at will into either the 'red' or the 'infra-red' circuit. The galvanometer * has an internal resistance of 450 ohms and a critical damping resistance of 12,000 ohms. The period is 2 seconds and with the scale at 1 metre distance the galvanometer spot is deflected through 15 cm. for each micro-ampere of measured current.

The light source in the earpiece is a 6-volt 0.3-amp, panel bulb. It can be fed with D.C. from an accumulator or with stepped down A.C. from the mains, but in the latter instance a voltage-regulating mechanism is imperative.

Wood [5] has shown that by using a slightly different earpiece filter, and by feeding both 'red' and 'infra-red' cell outputs into a single 'bucking' circuit, such as is used by Millikan, it is possible to produce a single scale direct reading version of the oximeter. In the ordinary form the values for the galvanometer deflection in both regions of the spectrum for the bloodless and blood-containing ear are applied to a simple formula derived from Beer's Law, and the resultant referred to the calibration curve to derive the absolute arterial oxygen saturation value.

SUMMARY

In order to study changes in arterial oxygen saturation during anaesthesia without recourse to direct arterial sampling, we have constructed an oximeter similar to that described by Wood and Geraci. Construction (rather than importation) was undertaken for reasons of economy.

The principles of light transmission and measurement involved in oximetry are discussed briefly and the design of our oximeter is described.

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* Manufactured by H. Tinsley & Co. Ltd., London, England.

PASSING EVENTS

ERRATUM

In the issue of 6 September, page 732, the key to the legend of Fig. 11 should read, 'C. Right superior intercostal vein'.

* * * *

Dr. A. J. H. Henning, M.B., B.Ch. (Rand), M.Rad. (Liverpool), D.M.R.T. (R.C.P. & S.), has resigned from the Radiotherapy Department at the Johannesburg General Hospital to join Dr. Maurice Weinbren at 3–5 Dunkeld Chambers, Smal Street, Johannesburg. Before his appointment in 1950 to the Johannesburg General Hospital, he held the post of Registrar at the Radium Institute, Liverpool, for 2 years.

The marriage took place at Cape Town on 20 September 1952 of Dr. D. J. Joubert (formerly of Paarl) and Miss Joan Oosterberg of Green Point. Dr. and Mrs. Joubert will make their home in Wellington.

* * * *

Dr. Harding le Riche has accepted a post in the Canadian Health Department in connexion with the *Sickness Survey*. Dr. le Riche left for Canada by air on 6 September, and his family will join him early next year.

American Medical Writers' Association

The 9th Annual Meeting of this Association was held on 1 October 1952 at the Jeffersen Hotel, St. Louis, Mo. The main business consisted of *A Symposium on Medical Writing* by medical editors and teachers in schools of journalism. In the evening Dr. W. W. Bauer was the guest speaker.

This Annual Meeting was held in association with the 17th Annual Meeting of the Mississippi Valley Medical Society.

Empire Medical Advisory Bureau

South African medical practitioners who are thinking of visiting the United Kingdom should get into touch with Dr. H. A. Sandiford, Medical Director of the Bureau, at B.M.A. House, Tavistock Square, London, W.C.1, so that all the facilities of the Bureau will be placed at their disposal.

Medical practitioners will find the Bureau helpful in arranging accommodation as well as post-graduate courses of study.

REVIEWS OF BOOKS

Antibiotic Survey

Antibiotics—A Survey of Their Properties and Uses. Published by direction of the Council of the Pharmaceutical Society of Great Britain. (Pp. 290 + ix, with 24 figures. Second Edition. 25s.) London: The Pharmaceutical Press.

Contents: Preface to Second Edition. Preface to First Edition. 1. Historical Summary. 2. Commercial Manufacture. 3. Chemistry. 4. Stability. 5. Standards and Methods of Assay. 6. Experimental Background. 7. Clinical Use. 8. Veterinary Practice. 9. Pharmacy and Pharmaceutical Preparations. 10. Legal Aspects of Antibiotics. 11. Commercial Preparations. Appendices. Index.

This authoritative volume is the successor to the first edition which appeared under the title *Penicillin: Its Properties, Uses and Preparations* in 1946. The almost incredible advances in the antibiotic field have quite properly required drastic revision of the presentation and the obvious change to the more appropriate title, which the present volume has been given.

This volume is particularly useful to the medical practitioner because, apart from giving him much practical knowledge which he must make the individual effort to acquire about the uses of antibiotics, it also gives him a sufficient experimental and theoretical background to enable him to prescribe antibiotics intelligently and in the best interests of the patient. In the nature of things, it is to be expected that another edition will soon be justified, because we do not yet seem to have reached the limits to the discoveries in the field of antibiotics. The Lilly laboratories, for example, have recently released Ilotycin (Erythromycin), an antibiotic which seems to shadow Penicillin very closely.

Although more developments along these lines can be expected, they are unlikely to nullify the great value of this volume, which will clearly become one of the standard works for consultation and reference, despite the numerous publications already available on antibiotics.

General Anaesthesia

Essentials of General Anaesthesia. By R. R. Macintosh, M.D., F.R.C.S., D.A. and Freda B. Bannister, M.D., D.A. (Pp. 378 + xi, with 247 figures. 40s.) Oxford: Blackwell Scientific Publications. Fifth Edition.

Contents: Preface. Preface to Fifth Edition. 1. History of Anaesthesia. 2. General Remarks. 3. Theory of Anaesthesia. 4. Respiration. 5. Cyanosis. 6. Signs of Anaesthesia. 7. Signs of Nitrous-Oxide Anaesthesia. 8. Indications for Local or General Anaesthesia in Dentistry. 9. Choice of General Anaesthetic. 10. Pre-Anaesthetic Medication. 11. The More Difficult Patient. 12. Children. 13. Status Lymphaticus. 14. Preparation for Operation. 15. Barbiturates. 16. Ethyl Chloride. 17. Vinesthene. 18. Trichlorethylene (Trilene). 19. Ether. 20. Chloroform. 21. Cyclopropane. 22. Curare and other Muscle Relaxants. 23. Preliminary Approach to Dental Anaesthesia. 24. Nitrous Oxide. 25. Endotracheal Anaesthesia. 26. Mouth-Gags, Props, Packs and Tongue-Forceps. 27. Care of the Unconscious Patient. 28. Respiratory Obstruction. 29. Emergencies. 30. Cylinder Valves and Reducing Valves. 31. Analgesia. 32. The Oxford Vaporiser. 33. Legal. Index of Personal Names. Index.

The fact that a fifth edition of this book has been required within a space of 12 years, testifies (in no uncertain measure) to its value and usefulness.

This is, indeed, a book which achieves what was intended—to supply a sound and sensible basis for the beginner in anaesthesia. The major change in this edition is the inclusion of a chapter on muscle relaxants. It is unfortunate that in a book of this nature the new material has been presented in a somewhat uncritical fashion—little regard being paid to the shortcomings of some relaxants—notably Decamethonium and Mephenesin. Apart from this minor criticism, however, the reviewer has little but praise to offer, and would most strongly recommend this book to any practitioner who wishes to gain a sound knowledge, not only of clinical anaesthesia, but also of the workings of anaesthetic machines.

Endoscopy

Endoscopy. By E. B. Benedict, A.B., M.S. (Pp. 373 + xiv, with 130 figures. 76s. 6d.) London: Baillière, Tindall & Cox.

Contents: *Part I—Bronchoscopy.* 1. Anatomy and Physiology of the Tracheobronchial Tree. 2. Technic. 3. Indications, Contraindications and Complications. 4. Bronchial Obstruction. 5. Non-Specific Infectious Diseases. 6. Specific Infectious Diseases. 7. Foreign Bodies in the Tracheobronchial Tree. 8. Benign Tumors of the Bronchus. 9. Bronchogenic Carcinoma. 10. Other Primary Malignant Bronchopulmonary Tumors. 11. Metastatic Malignant Disease of the Bronchus. 12. Tumors of the Trachea. 13. Miscellaneous Conditions Affecting the Bronchi.

Part II—Esophagoscopy. 14. Anatomy and Physiology of the Esophagus. 15. Technic. 16. Indications, Contraindications and Complications. 17. Esophagitis. 18. Hiatus Hernia. 19. Esophageal Ulcer. 20. Benign Stricture. 21. Lye Stricture. 22. Web. 23. Achalasia (cardiospasm). 24. Diverticulum. 25. Varices. 26. Benign Tumor. 27. Carcinoma. 28. Other Malignant Tumors Involving the Esophagus. 29. Foreign Bodies in the Esophagus. 30. Extrinsic Pressure. 31. Trauma. 32. Bronchoesophageal and Tracheoesophageal Fistula. 33. Specific Infectious Diseases. 34. Miscellaneous Conditions Affecting the Esophagus. 35. Paralytic Dysphagia. 36. Emotional Disorders of Swallowing.

Part III—Gastroscopy. 37. Anatomy, Physiology and Gastroscopic Appearance of Normal Stomach. 38. Technic. 39. Indications, Contraindications and Complications. 40. Gastritis. 41. Gastric Ulcer. 42. Benign Tumor. 43. Carcinoma. 44. Other Malignant Tumors Involving the Stomach. 45. Specific Infectious Diseases. 46. Miscellaneous Conditions Affecting the Stomach.

Part IV—Peritoneoscopy. 47. History, Technic and Indications. 48. Evaluation of the Method and Analysis of Results. 49. Endoscopic Photography. 50. The Endoscopist. Index.

Dr. Benedict, in his preface, states that the object of his book is to present to the medical profession a book on endoscopy as related to medicine and surgery.

There can be no doubt that much of the progress of surgery in its many fields has been due to our increased knowledge of the organs and their functions. Endoscopy provides a means of extending the scope of inspection from the surface of the body to the interior and gives information about the function of the part under inspection, at the same time permitting the recognition of disease.

This volume deals with some of the fields open to inspection by endoscopy, viz. the respiratory system, the upper alimentary system and the general peritoneal cavity.

After an interesting historical survey of the endoscopic art, bronchoscopy is discussed fairly completely. The actual technique is described inadequately, especially in connexion with sedation. Local anaesthesia with cocaine is recommended for all cases except for children under 12 years of age, for whom ether anaesthesia is advocated. These views are unacceptable to many surgeons doing bronchoscopy.

The actual information obtained from bronchoscopic examination is well presented with colour pictures to illustrate the more frequently encountered lesions. A chapter on bronchography is included in this section, but it is startling

to read that 'bronchography ordinarily gives no useful information and, in fact, is usually contra-indicated in abscess, asthma, tuberculosis and tumour.' A notable omission is the technique of removal of foreign bodies.

The discussion of oesophagoscopy suffers from similar shortcomings, though there are good and full descriptions of the diseases of the oesophagus. Each entity is dealt with under the headings of *Definition, Occurrence, Etiology, Pathology, Complications, Symptomatology, Diagnosis, Oesophagoscopy* and *Treatment*. Good radiographic reproductions amplify this section.

Gastroscopy and peritoneoscopy are more ably and fully described. Several excellent coloured pictures guide the observer in his recognition of the diseases involving the areas under inspection.

It must, however, be very unusual for peritoneoscopy to be employed in preference to an exploratory laparotomy.

This book emphasizes that a surgeon should be capable of doing his own internal inspections and that it is not yet practical to regard endoscopy as a speciality. Apart from some careless editing and binding errors, it is certainly worth the attention of students interested in thoracic and abdominal surgery, who will find it well worth their while to acquaint themselves fully with the regions of the body on which they intend to operate.

NURSING

Theory and Practice of Nursing. By M. A. Gullan, S.R.N. (Pp. 240 + xvi. 18s. 6th edition.) London: H. K. Lewis & Co. Ltd.

Contents: 1. Surgical Technique. 2. Food and Feeding of Patients. 3. Elementary Dietetics. 4. Digestion. 5. Absorption. 6. Defaecation and Examination of Stools. 7. Enemata. 8. Artificial Feeding. 9. Lavage and Douching. 10. Blood. 11. Blood-supply to the Tissues. 12. The Pulse. 13. Respiration. 14. Temperature. 15. Baths, Spongings, Packs. 16. Micturition and Catheterization. 17. Administration of Drugs. 18. External Local Applications. 19. Acute Infectious or Contagious Diseases. 20. The Enteric Group. 21. Infective Diseases of Respiratory Tract and Lungs. 22. Acute and Chronic Heart Diseases. 23. Notes on Gynaecology. 24. Notes on Surgical Nursing. 25. Hints on Private Nursing.

Miss Gullan's book is now in its 6th edition, and by its very excellence, at its first appearance, needs no revision beyond those additions which the almost overwhelming advancements in medicine necessitate.

Though *Theory and Practice* is primarily intended for the student nurse, it should prove invaluable, as a book of reference and revision, to the qualified sister; for it is one of those rare textbooks that seems to grow in conformity with the ever-increasing knowledge and experience of the student—a tribute to the profound professional knowledge of the writer, coupled with a deep understanding of the psychology and the needs of the young nurse.

In subject matter this book covers a very large area, but nowhere is it cluttered up with anything that does not come within the direct scope of a nurse's work. On the other hand, it does not fall into the error of leaving out many seemingly unimportant details which may prove to be a source of embarrassment to the inexperienced nurse. Sister Gullan obviously regards the carrying out of a doctor's instructions as an exact science, where nothing should be left to chance.

Theory and Practice of Nursing is a book that should prove stimulating and inspiring to every nurse who looks upon her profession as a vocation, and not a mere means of livelihood.

ENDOCRINE DIAGNOSIS

Endocrine Diagnosis. By H. Ucko, M.D. (Pp. 512 + xvi, with illustrations and 26 tables. 42s.) London and New York: Staples Press. South African Representative: J. Romyn, P.O. Box 613, Cape Town. 1951.

Contents: *Part I. Differential Diagnosis of Endocrine Symptoms and Signs*. 1. The History. 2. Clinical Findings.

Part II. Diseases of the Endocrine Glands. 1. Physiology and Disorders of the Thyroid Function. 2. Physiology and Disorders of Parathyroid Function. 3. Physiology and Disorders of Pancreatic Islet Function. 4. Physiology and Disorders of Adrenal Function. 5. Physiology and Disorders of Gonadal Function. 6. Physiology and Disorders of Pituitary Function. 7. Physiology and Disorders of Pineal and Thymus Functions. Addenda. Books Used or Recommended. Index.

The author has written this book primarily for the clinician. The book has been divided into 2 parts. The first deals with the endocrine influences on the body structures and the mechanism of the major events of life. The second contains a systematic description of the endocrine glands and their diseases.

In the first part a lot of space is devoted to the family and personal history of the patient, particularly from the endocrine approach, and signs and symptoms in relation to endocrinology are discussed very thoroughly. The approach is very physiological and accurate, but does not make for easy reading. Signs and symptoms are discussed but, when not dealt with in relation to a disease, the reader is inclined to become bored. The medical student, however, will find this section of interest and full of information.

The second section concerns the diseases of the endocrine system. These are dealt with adequately. The author's approach is refreshing, but the general lay-out will tire the reader, as no attempt has been made to break up the text with headings and sub-headings.

However, the illustrations are good and references are sufficient. This book can be recommended for those who wish occasionally to read something about the ductless glands.

ATLAS OF BLOOD DISEASES

A Clinical Atlas of Blood Diseases. By A. Piney, M.D., M.R.C.P. (Pp. 135 + viii, with 48 illustrations, 45 in colour. Seventh Edition. 21s.) London: J. & A. Churchill Ltd.

This *Atlas* was first prepared in 1930 by Dr. A. Piney and Dr. Stanley Wyard, both well-known London physicians. It is now in its seventh edition. Dr. Wyard has died recently and Dr. Piney has prepared this edition. He writes: 'It is hoped that the condensed information, clinical, haematological and pathological, will continue to meet the needs of senior students and practitioners by adding a little to their knowledge, by recalling facts which have slipped their memory, or by stimulating them to seek further information in the literature.' This is a view with which this reviewer concurs, for this book has served a useful purpose during the last 20 years and will continue to be read by those who seek concise information, from a small book of their own, in the field of haematology.

THE INTERNATIONAL PHARMACOPOEIA

Expert Committee on the International Pharmacopoeia, Ninth Report. World Health Organization Techincal Report Series No. 50. (Pp. 33. 2s.) Geneva: World Health Organization.

Contents: 1. Resolutions adopted at the Fourth World Health Assembly and at the eighth session of the Executive Board. 2. Publication of the *Pharmacopoea Internationalis*, first edition, volume I. 3. Agreement revising the Agreement respecting the Unification of Pharmacopoeial Formulas for Potent Drugs, signed at Brussels on 20 August 1929. 4. Preparation of the *Pharmacopoea Internationalis*, first edition, Volume II. 5. Relations with the WHO Expert Committee on Biological Standardization. 6. Relations with the World Medical Association, the International Pharmaceutical Federation, and the International Labour Organization. 7. Fellowships. 8. New Monographs and appendices for the *Pharmacopoea Internationalis* and addenda. 9. Preparation of a session on the control of pharmaceutical products. 10. International non-proprietary names for drugs. 11. Name of Expert Advisory Panel.

The ninth report of the WHO Expert Committee on the International Pharmacopoeia has just been published as No. 50 in the *Technical Report Series* of the World Health Organization.

The preparation of Volume II of the *Pharmacopoea Internationalis* (Ph.I.) is discussed; the report states that 134 monographs on pharmaceutical preparations and 9 appendices covering analytical methods, etc., have been completed up to the present time. The first annexure to the report summarizes the work allotted to various members of the committee—preparation of draft monographs and carrying out of experimental investigations; the second annexure gives a list of monographs and appendices submitted for inclusion in Volume II.

The Executive Board has approved a resolution inviting the Director-General of WHO to take the steps necessary between the States signatories to the Brussels Agreements for the unification of pharmacopoeial formulae for potent drugs

to terminate these agreements. The text of a draft Protocol for this purpose is contained in a third annexure.

The fourth annexure is devoted to the third report of the committee's sub-committee on Non-Proprietary Names. In discussing the problem of the protection of international non-proprietary names, the sub-committee suggested that manufacturers seeking new names should approach WHO through national pharmacopoeia commissions or national health administrations. The importance of having the names selected on an international level by WHO, in the first instance, is stressed in the report. An appendix contains a list of the Latin, English and French international non-proprietary names, together with the appropriate chemical names or descriptions, agreed upon at the sub-committee's third session.

REFRACTION

Principles of Refraction. By Sylvester Judd Beach, A.B., M.D., F.A.C.S. (Pp. 158, with 18 illustrations. £1 14s.) Cape Town: P. B. Mayer. 1952.

Contents: 1. Practical Optics. 2. Refractive Errors. 3. Records. 4. Retinoscopy. 5. Routine of Subjective Refraction. 6. The Cycloplegic Refraction. 7. Treatment of Ametropia. 8. Ocular Neuroses.

Notes on Refraction would have made a more fitting title for this little book. Though it contains much that is interesting, it lacks the thoroughness one expects from a textbook.

This book reads easily as it is well written. Difficult and abstruse subjects are rendered lucid and comprehensible by the remarkable talent of the author for simplification. Thus it is a pity he has not chosen to elucidate some of the difficult problems in refraction. Important topics such as heterophoria, anomalies of motility and convergence, aniseikonia, prisms and centering of lenses are not dealt with.

One-third of the whole book is devoted to subjective methods of refraction, no less than 29 being devoted to subjective tests for astigmatism, on which much reliance is placed. Presbyopia and the prescribing of spectacles for near vision get only 2½ pages.

Nonetheless this book, which is essentially practical in its advice, has value. The beginner will find very lucid, though novel, explanations of optical problems, and the practising ophthalmologist will find the chapter on ocular neuroses both illuminating and interesting.

HEART AND CIRCULATION

Disorders of the Heart and Circulation. Edited by Robert L. Levy. (Pp. 944 + xvi, with 268 figures. 91s. 6d.) London: Baillière, Tindall & Cox.

Contents: 1. Prevalence of Heart Disease. 2. The Pathologic Physiology of the Circulation. 3. Diseases of the Pericardium. 4. Chronic Constrictive Pericarditis. 5. Congenital Heart Disease. 6. The Physiology of Congenital Heart Disease. 7. Surgical Therapy of Congenital Cardiovascular Defects. 8. Rheumatic Heart Disease. 9. Bacterial Endocarditis. 10. Chronic Valvular Heart Disease. 11. Hypertensive Vascular Disease. 12. Surgical Therapy of Hypertension. 13. Coronary Artery Disease and Coronary Occlusion. 14. Coronary Insufficiency. 15. Surgical Treatment of Angina Pectoris. 16. Pulmonary Heart Disease. 17. Cardiovascular Syphilis. 18. The Heart in Acute Infectious Diseases. 19. The Heart in Vitamin Deficiencies. 20. Traumatic Heart Disease. 21. Primary Tumors of the Heart and Pericardium; Invasion of the Heart by parasites. 22. Congestive Heart Failure. 23. Abnormal Mechanisms of the Heart. 24. The Hyperactive Carotid Sinus Syndrome. 25. Cardiac Neurosis. 26. Neurocirculatory Asthenia. 27. Clinical Electrocardiography. 28. Roentgenology of the Cardiovascular System. 29. Arteriosclerosis. 30. Diseases of the Peripheral Vascular System. 31. Arteriovenous Aneurysm. 32. Periarteritis Nodosa. 33. Proliferative Endarteritis. 34. Lupus Erythematosus Disseminatus. Index.

This encyclopaedic work consists largely of articles written originally for *Nelson's Loose-Leaf Medicine*, brought up to date by their authors. A book of this sort, with over 40 contributors, has its advantages and disadvantages.

One advantage of having many contributors is that, with the great advances in knowledge of cardio-vascular disease, it is becoming increasingly difficult for one person, however experienced, to write with authority on all issues. It is refreshing, therefore, to find that there is not only an extremely high standard (which one expects from writers of such eminence) but that the views are moderate and well balanced. Although no details are spared, the student, practitioner or physician reading this book, may keep his feet on the solid earth.

With so many excellent monographs, it is difficult to pick out special ones for mention. The chapter on *Electrocardiography* is very useful, giving full ranges of normal values as well as generously illustrated abnormalities. In the section on congenital heart disease there is a classic article by Maude Abbott with further chapters on modern methods of investigation for the selection of cases for surgery. The indications for sympathectomy for hypertension are given cautiously and conservatively.

The chief disadvantage is a lack of continuity in approach. The continuity which is found in the standard textbooks by single authors is very valuable. Also, inevitably, there is a certain amount of overlapping. Another disadvantage is that by the time a book of this size eventually comes into print, further knowledge has accumulated. For example, there is no mention of hexamethonium for hypertension or of procaine amide for certain arrhythmias.

However, these difficulties are inherent in any textbook of this kind. There is no doubt that it contains an enormous amount of information and is a most desirable possession. It is beautifully illustrated and contains numerous graphs and illustrations.

DENTAL PRACTITIONERS' FORMULARY

Dental Practitioners' Formulary 1952. (Pp. 28. Ordinary Edition 1s. 6d., Interleaved 3s.) London: The Pharmaceutical Press and The British Medical Association. 1952.

This little *Formulary* is of interest to dentists and may be of some value to dental practitioners in the Union as it sets out those preparations contained in the National Formulary, together with certain preparations not included but which are covered by the Third Schedule to the National Health Service (General Dental Services) Regulations, 1948, as amended.

The preface points out: 'The commercial practice of issuing the same medicinal substances under a variety of proprietary names has caused many difficulties. The General Medical Council has, therefore, approved non-proprietary names which may be used freely by manufacturers and has expressed the hope that these names will be generally adopted and used in prescribing. To assist prescribers to do this, a list of substances appearing in this Formulary is included on page 9, giving details of the B.P., B.P.C. and Approved Names together with other names used for the same substances.'

DERMATOLOGY AND SYPHILOLOGY

The 1951 Year Book of Dermatology and Syphilology (December 1950–November 1951). Edited by Marion B. Sulzberger, M.D. and Rudolf L. Baer, M.D. (Pp. 476, with 61 figures. $5.50.) Chicago: The Year Book Publishers, Inc. 1952.

Contents: 1. Some Common Errors in the Management of Skin Diseases. 2. Treatment and Prevention (Exclusive of Venereal Diseases). 3. X-Ray and Other Physical Therapy. 4. Eczematous Dermatitis and Urticaria (Allergic and Nonallergic); Allergy. 5. Drug Eruptions (Allergic and Nonallergic). 6. Miscellaneous Hematogenous Dermatoses. 7. Other Dermatoses. 8. Cancers; Precancerous; Other Tumors. 9. Fungous Infections. 10. Other Infections; Infestations. 11. Venereal Diseases and Their Treatment (Exclusive of Gonorrhea). 12. Investigative Studies: A. Dermatologic. B. Venereal Diseases. 13. Miscellaneous. Index.

Another milestone recording the progress in dermatology appears in the 1951 *Year Book*. This edition maintains the high standard of previous ones.

Following the usual pattern the Editors start with a long original article on what they term *A Guide for the General Practitioner*. This year they discuss common errors in the diagnosis and management of skin diseases. A few dermatologists might differ here and there with the opinion expressed, but all will agree that the authors are over-modest in claiming that this article is for the general practitioner alone; the specialist must admit that for him this chapter alone merits the purchase of this book.

The bulk of this volume consists of abstracts of dermatological writings during 1951, with pithy erudite critical editorial footnotes on the articles. Much attention is naturally given to the evaluation of the use and abuse of ACTH and Cortisone in diseases of the skin.

The *Year Book* has become a *Vade Mecum* for dermatologists. No physician interested in the subject can afford to do without it.

ACUTE DEHYDRATION

The Treatment of Acute Dehydration in Infants. By A Working Team Appointed and Advised by the Committee on Acute Infections in Infancy. Privy Council. Medical Research Council Memorandum No. 26. (Pp. 49 + iv, with illustrations. 3s.) London: Her Majesty's Stationery Office. 1952.

Contents: 1. Aetiology. 2. Mechanism and Consequences. 3. Assessment. 4. Treatment. 5. Accommodation and Facilities for Care of the Dehydrated Infant. 6. Summary of Assessment and Treatment of Dehydration. Appendices. Acknowledgements. References.

There is a special tendency for illness in infancy to be complicated by dehydration, and within recent years this problem has stimulated much attention. Greater understanding of the complex biochemical changes involved, and improved techniques in maintaining optimum water and electrolyte balance have radically altered the prognosis, particularly of the infantile diarrhoeas.

The modern treatment of dehydration has become a much more exact procedure. A working team under the Chairmanship of Professor Moncrieff was appointed by the Medical Research Council to review the present position. Within the 50 pages of this memorandum the subject has been covered most adequately. Both principles and practice in treatment are clearly stated and the matter is authoritative, up to date and of that standard of excellence one has come to take almost for granted in Medical Research Council memoranda. This publication will be studied with benefit by both practitioner and student to whom it may be recommended strongly.

INTERNATIONAL SANITARY REGULATIONS

International Sanitary Regulations. Official Records of the World Health Organization No. 37. (Pp. 443. 16s. 3d.) Geneva: World Health Organization.

Contents: Part I—Proceedings. Special Committee appointed by the Third World Health Assembly to consider the draft International Sanitary Regulations. 1. Minutes of Special Committee. 2. Minutes of Sub-Committee on the Mecca Pilgrimage. 3. Committee on International Sanitary Regulations of the Fourth World Health Assembly. 4. Fourth World Health Assembly in Plenary Session.
Part II—The International Sanitary Regulations.

A record of the successive steps leading to the accomplishment of one of the most important tasks yet undertaken by the World Health Organization—the revision of the International Sanitary Conventions and their consolidation into a single set of International Sanitary Regulations—is contained in a volume just produced by the Organization. These Regulations will govern measures applicable throughout the world to all forms of international transport for the control of the 6 'quarantinable diseases'—plague, cholera, yellow fever, smallpox, typhus and relapsing fever.

The entry into force of the Regulations on 1 October 1952 will mark an outstanding event in the history both of international quarantine and of international treaty making; and the present volume will constitute not only a practical source of reference for public-health administrations, but also a valuable permanent record for medical historians and libraries.

The volume—No. 37 in the WHO *Official Records* series—consists of 2 parts, with an introduction which traces the history of international quarantine and gives examples of the confusion which has hitherto resulted from the co-existence of a multiplicity of sanitary conventions. It is pointed out that the new Regulations are conceived in a form which permits both of simple and expeditious adoption by governments and of rapid revision, when occasion demands, by the World Health Organization or its organs. The introduction goes on to describe the various stages in the drawing-up of the Regulations: the initial preparation by the WHO Expert Committee on International Epidemiology and Quarantine, their subsequent consideration by Special Committees of the Third and Fourth World Health Assemblies, and finally their adoption by the Fourth World Health Assembly on 25 May 1951.

Containing as it does a detailed account of the proceedings leading to the adoption of the Regulations, the volume provides at the same time valuable background information on the considerations and principles on which they are based—particularly the fundamental principle of maximum security against the introduction of pestilential diseases with a minimum of interference with international traffic.

Part I of the volume comprises the debates of the Special Committee and of its Sub-Committee on the Mecca Pilgrimage, together with the reports of the various sub-committees and working parties. It also contains a set of resolutions on international quarantine matters adopted by the Fourth World Health Assembly on the recommendation of the Special Committee. These resolutions reflect the Health Assembly's intention of making the International Sanitary Regulations the first of a series of international regulations for the control of epidemic diseases carried by international traffic and emphasize the opinion of the experts drafting the Regulations that 'a community is more effectively protected against pestilential disease by its own public-health service than by sheltering behind a barrier of quarantine measures'.

Part II is devoted to the text of the International Sanitary Regulations, accompanied by an explanatory memorandum, a table of comparison with existing International Sanitary Conventions and an analytical index.

SKIN THERAPY

Skin Therapeutics, Prescription and Preparation. By Dr. M. K. Polano. (Pp. 276 + xvi. 37s. 6d.) Amsterdam: Elsevier Publishing Company.

Contents: 1. General Considerations on Dermatotherapeutics. 2. The Basic Materials. 3. The Use of the Basic Materials in Prescriptions. 4. Specific Drugs. 5. Selecting the Ointment Base in Various Dermatological Conditions. 6. The Effect of Drugs on the Skin in Relation to the Base. 7. Tables. Literature. Index.

The amount and variety of material applied to the skin daily throughout the world must be enormous, and although a vast knowledge about dermatotherapeutic agents and vehicles for their application exists, this is scattered throughout the literature. A really sound scientific basis for the application of drugs to the skin is often lacking. In this book, which deals with this problem in great detail, extensive experimental work done by the author reveals many of the fallacies and the lack of foundation in much of the prescribing for skin disorders. Classical and modern prescriptions are given, and attention drawn, through comparison of prescriptions used in different countries and with a number of comprehensive tables of preparations, to the similarities and differences existing in differences pharmacopoeias. The method of paired comparisons of skin remedies ('left and right method'), not sufficiently used by workers for statistical evaluation of results obtained in similar cases, is mentioned. Stress is made of the importance of the vehicle in specific treatment as at least that of the incorporated drug.

In spite of the progress in endocrinology, vitaminology and radiology, local application is still the most widely used medication in skin diseases. This book is unique in that it is devoted entirely to local treatment of skin diseases. General principles, minute details and practical suggestions are discussed in an authoritative manner.

This monograph will be valuable to all interested in dermatology and skin therapeutics, to pharmacists and pharmaceutical organizations.

NOTIFIABLE CAUSES OF DEATH

Annual Epidemiological and Vital Statistics 1939–1946. Part II: Cases of and Deaths from Notifiable Diseases. (Pp. 202. 20s.) Geneva: World Health Organization.

Contents: 1. Cases of and deaths from Infectious Diseases reported in each country from which official reports are received, 1939-1946. 2. Notifiable Diseases in various countries in 1946.

This volume forms Part II of the *Annual Epidemiological and Vital Statistics, 1939–1946*, published by the World Health Organization.

Part I, entitled *Vital Statistics and Causes of Death*, which was published in 1951, indicated the area of countries and their population, and gave data on nuptiality, natality, fertility, and mortality (general, infant, and neonatal), as well as on causes of death.

Part II contains information on cases of and deaths from

notifiable diseases. There are some thirty such diseases, ranging from plague to puerperal infection, and including the rickettsioses, malaria, leprosy, syphilis, influenza, and the communicable diseases of childhood. Figures for cases and deaths are given for more than 150 States or territories.

The importance of this work for all those interested in health statistics or the trend of communicable diseases throughout the world is obvious. This is, at present, the only official source of such information covering so large a number of countries, particularly during the war years for which it has been hitherto impossible to collect coherent information.

In preparing this volume, duly revised data from official publications were used as well as replies to questionnaires addressed to national health administrations and statistical offices.

The work is presented in a clear and practical manner. For each disease, there is a large table showing, by country and for each of the years 1939 to 1946, the total number of cases and deaths per year and the number of cases and deaths per month or 4-week period (to show seasonal fluctuations). At the end of each table certain countries are included for which only annual totals are given, either because the total figures were the only data available or because they were too small to be broken up into periodic figures; similarly, annual figures only are given for a dozen or so diseases which have no marked seasonal tendencies. Full notes are appended to all tables.

A synoptic table lists the diseases which, on 31 December 1946, were notifiable in a certain number of countries; the volume is completed by an alphabetical index.

The fact that this volume follows on without a break from the series published by the League of Nations from 1923 onwards increases its value as a document for reference and study.

ENVIRONMENTAL SANITATION

Expert Committee on Environmental Sanitation, Second Report. World Health Organization, Technical Report Series, No. 47. (Pp. 21. 1s. 3d.) Geneva: World Health Organization.

Contents: 1. Introduction. 2. Categories of personnel. 3. Education and Training. 4. Establishment of training centres. 5. Utilization of personnel. 6. Recapitulation of main recommendations.

The second report of the WHO Expert Committee on Environmental Sanitation, which is now available as No. 47 in the *Technical Report Series* of the World Health Organization, is largely devoted to a detailed study of the activities, categories, education and training, and maximum utilization of sanitation personnel.

The functions of sanitation personnel vary greatly from country to country, according to the structural pattern of the environmental sanitation services. This necessarily depends upon the organization of health services in the country concerned which may be 'vertical'—in separate specialized organs; 'horizontal'—in more generalized larger departments; highly centralized; largely decentralized; or a combination of the various systems.

It is recognized that the activities of sanitation personnel may be divided, nevertheless, into three main groups: (1) the design, construction, and supervision of operation and maintenance, of works intended to improve the environment in the interests of health; (2) the inspection of, and preparation of reports on, existing environmental conditions, and the taking of measures to prevent or adjust faults which are revealed and to ensure compliance with legal provisions; and (3) the stimulation of local interest in possible improvements in environmental conditions.

The following main categories of personnel which contribute, either directly as sanitation specialists, or less directly as members of the health team or as voluntary workers, to the improvement of sanitary conditions, are described: sanitary (public health) engineers; plant operators; sanitarians (subdivided into sanitary inspectors, health assistants, and health aids); medical officers of health; scientists, such as chemists; industrial hygiene workers; personnel engaged in personal health services, such as general practitioners and nurses; and voluntary workers.

Suggestions are made with regard to the education and training best suited to the various categories, and the development of essential training centres is discussed. It is recommended that regional centres, offering field training facilities, should be established for the post-graduate training of sanitary engineers and medical officers of health, that urban centres providing training in inspection duties should be promoted, and that demonstration training centres should be inaugurated in rural areas to educate voluntary workers.

Sanitation personnel will make their greatest possible contribution to the promotion of health only if planning and direction are the responsibility of highly skilled specialists, a factor of particular importance in underdeveloped regions; if they are provided with opportunities of advancement; if they are free to devote themselves full-time to their work; and if they receive full co-operation from their colleagues whatever their branch of activity.

SERUM SICKNESS

Serum Sickness. By C. Frh. von Pirquet, M.D. and Bela Schick, M.D. (Pp. 130 + xi, with charts. 28s.) London: Baillière, Tindall & Cox; Baltimore: Williams & Wilkins Company, 1951.

Contents: Introduction. 1. Clinical Aspects of Serum Sickness. 2. The Reinjection. 3. Theory of Serum Sickness.

Here is a book which it is a privilege to possess. One is reminded of other medical classics such as Loeffler's original monograph on Diphtheria and one is impressed anew with the careful and lucid observations which went into such works. The accuracy of these is confirmed by the belief in and the extension of their message which is apparent to-day.

Those to whom allergy is still a confused subject will derive great benefit from a study of this book. They will be able to follow the processes by which the original keystone was shaped and fashioned and be able to appreciate where it sits to-day in the edifice which is being built, but which is by no means complete.

Criticisms of the book in the academic sense would be out of place because they are implied in the more up-to-date literature on allergy and allied subjects. What must be recorded is appreciation of the joy to be derived from reading such a classic and being transported back through the years to the scene of the struggle in the birth of a new conception in disease. By means of a careful translation and of the use (in places) of the original typescript, the atmosphere comes to life and no one could read the book without being sensitive to it. It is a book of but 130 pages and should not be missed.

SODIUM METABOLISM

Sodium Metabolism in Health and Disease. By Douglas A. K. Black, M.D., M.R.C.P. (Pp. 79 + x, with 4 figures. 9s. 6d.) Oxford: Blackwell Scientific Publications. 1952.

Contents: 1. Introduction. 2. Amount and Distribution of Sodium in the Body. 3. Regulation of Body Sodium. 4. Internal Circulation of Sodium. 5. Sodium Metabolism in Infancy. 6. Abnormalities of Sodium Metabolism. 7. Syndromes of Disordered Sodium Metabolism. 8. Generalisations on Sodium Metabolism. References.

The importance of sodium determinations in the recognition and control of a variety of conditions has grown remarkably in the last few years, and the ease and speed with which the concentration of sodium can be determined in plasma or urine have given sodium determinations a greatly enhanced clinical value. Dr. Black's book will therefore be of interest to many and particularly to those responsible for the maintenance of a normal *milieu intérieur* after operations and after medical disasters such as acute renal tubular failure (lower nephron nephrosis). The relationship of sodium to oedema and to blood pressure is also very important.

There is an accumulation of facts about the behaviour of sodium in disease and in physiological experiments which is recorded in this book but, as the author says, anything approaching a complete understanding of the sodium problem is yet to seek. In the meanwhile many observations stand apart and have no satisfactory explanation at the present time.

It is a pity that many misprints spoil an otherwise well produced book.

The Medical Association of South Africa
Die Mediese Vereniging van Suid-Afrika

AGENCY DEPARTMENT: AGENTSKAP-AFDELING

KAAPSTAD : CAPE TOWN

Posbus 643, Telefoon 2-6177: P.O. Box 643, Telephone 2-6177

PRAKTYKE TE KOOP : PRACTICES FOR SALE

(1094) Eastern Province hospital town. Practice with scope for surgery. Average annual receipts, £3,000. Premium of £2,500 includes drugs and very complete surgery furniture. Large house in good residential area for sale at £4,000. This is a better-class general practice with a strong obstetrical and gynaecological bias.

(974) Western Cape. Unopposed solus dispensing practice with four appointments. Gross annual receipts, £4,300. Premium required, £4,000, includes surgery furniture, X-ray plant, drugs and transference of the appointments. Modern 12-roomed d/s house to let at £15 per month. Easy terms.

ASSISTENTE/PLAASVERVANGERS VERLANG ASSISTANTS/LOCUMS REQUIRED

(1119) South West Africa. For partnership practice. From 1 January or as soon thereafter as possible, for 3 months. Car will be provided. £2 12s. 6d. per day plus board and lodging and travelling allowance.

CONSULTING ROOMS WANTED

(1082) Specialist requires consulting rooms in central Cape Town for a few hours daily. Wishes to share waiting room and services receptionist. (Quote also **1136**.)

FOR SALE

(1071) High-frequency diathermy set (Lepel). £30.

(1108) MICROSCOPE (Reickert, Vienna) in excellent condition. 4 Objectives—1 Oil Immersion. 4 Eyepieces. Inclined binocular vision and a straight monocular tube.

NURSING HOME FOR SALE

(1020) As going concern in large centre. Details on application.

* * * *

DURBAN

112 Medical Centre, Field Street. Telephone 24049

PRACTICES FOR SALE: PRAKTYKE TE KOOP

(PD10) General practice, Natal inland city. European and non-European patients. Scope for midwifery and surgery. Premium required £1,250, cash preferred, but terms will be considered. For immediate sale.

(PD13) Natal Lower South Coast practice, near Pondoland border, suitable for retired doctor. Area developing and large Police holiday camp in vicinity. Excellent climate and very good fishing. Premium required £400, includes good stock of drugs and dressings, instruments and dispensary furniture. House for sale £1,800, including stand of one-third morgen. Bond available. For immediate sale. Owner having taken a full-time appointment.

LOCUM REQUIRED

Natal Midlands village. Month of November, £2 12s. 6d. per day, free board and lodging. Petrol and oil supplied. Single man preferred, but not essential. Mixed country general practice. No midwifery or major surgery. Hardly any night work. Dispensing of stock mixtures only. Native interpreter employed.

(117) Natal Midlands. From 2 November to 2 December. 2½ guineas per day, free board and lodging. Free petrol and car allowance. Mixed general practice.

(114) Durban. From 12 December to 10 January, approximately. £2 12s. 6d. per day, lodging. Car and driver supplied, if necessary. Knowledge of Afrikaans desirable. General practice, R.M.O. appointment and non-European consulting room.

(106) Zululand. From 30 December to 30 January 1953. £2 12s. 6d. per day, car allowance. Single man or woman. Must possess own car. General country practice. Senior partner of the firm will be present throughout living 8 miles away.

(116) Near Durban. January 1953. £2 12s. 6d. per day, board, lodging. Own car desirable. Afrikaans essential. Mixed general practice, with R.M.O. appointment.

(118) Near Durban. From 3 January 1953 for 2 weeks. £3 per day, free board and lodging in the doctor's house. Car allowance of £2 per week. Afrikaans essential. Must possess own car. General practice, R.M.O. appointment.

* * * *

JOHANNESBURG

Medical House, 5 Esselen Street. Telephones 44-9134-5, 44-0817
Mediese Huis, Esselenstraat 5. Telefone 44-9134-5, 44-0817

PRAKTYKE TE KOOP : PRACTICES FOR SALE

(Pr/S34) Progressive Transvaal town dispensing practice. Average gross income £3,500 p.a. Excellent surgical facilities. Owner going overseas.

(Pr/S39) Pretoria practice. Gross annual income £3,200 to £3,500. Premium required £1,750. No house for sale. Full details on application.

(Pr/S51) Transvaal hospital town dispensing practice. Gross income over £6,000 per annum. It is essential that this practice be worked by two men, one to be a surgeon. Premium required £3,500, and terms could be arranged. Practice can only be sold if house and surgery are bought for cash. Details on application.

(Pr/S52) Progressive Transvaal hospital town. Practice with excellent scope for expansion. Premium required £600 and terms could be arranged. Premium includes drugs, furniture and instruments valued at £160.

(Pr/S54) Established branch practice in Johannesburg. Annual income £1,000. Premium required £500. Very much scope for expansion.

(Pr/S55) Well-established practice in northern suburbs of Johannesburg. Will suit an English-speaking doctor. Premium required £1,000. Full details on application.

(Pr/S56) O.F.S. Practice. Annual net income over £3,000. Premium required £2,000 and this includes X-ray machine worth £500 and some surgery furniture. £1,000 deposit and balance payable at £50 per month.

(Pr/S57) Small Johannesburg practice, with excellent scope for expansion. Full details on application.

MEDICAL EQUIPMENT

(I/O4) MacPhail-Strauss Electro Convulsant Unit. £90.

(I/O30) Cooke, Troughton & Simms Microscope in excellent condition. £40.

(I/O31) Siebert Microscope, mechanical stage, 3 eye-pieces, oil immersion lens. £50.

(I/O38) Jones Waterless Basal Metabolism Apparatus. £80.

(I/O39) Cambridge Portable Electrocardiograph, with extra attachments, complete, for chest leads. £80.

(I/O41) Microscope, Bausch & Lomb. Condition as new. Two eye-pieces. Oil high and low power lenses. Shifting stage. Lock-up case. £55.

(I/O44) 'Peerless' Diathermy machine, with accessories and Caput applicator. £65.

S.A. Iron and Steel Industrial Corporation Limited

APPOINTMENT OF PART-TIME MEDICAL OFFICER AT SISHEN

Applications are invited from general medical practitioners to render services to employees of the Corporation and members of the Iscor Medical Benefit Fund, stationed at the Corporation's Mining Operations at Sishen, North Western Cape.

Applications must reach the undersigned on or before 20 October 1952.

Application forms, together with full particulars, will be forwarded to *bona fide* applicants on written application to the undersigned.

A. E. Hardenberg
Personnel Manager

P.O. Box 450
Pretoria
22 September 1952

S.A. Yster- en Staal Industriële Korporasie Beperk

AANSTELLING VAN 'N DEELTYDSE MEDIESE BEAMPTE TE SISHEN

Aansoeke word ingewag van algemene mediese praktisyns om dienste te lewer aan werknemers van die Korporasie en lede van die Yskor Mediese Bystandsfonds, woonagtig te Sishen, Noord-Westelike Kaap.

Aansoeke moet die ondergetekende voor of op 20 Oktober 1952 bereik.

Aansoekvorms en volledige besonderhede sal op skriftelike aansoek aan ondergetekende aan *bona fide* applikante gestuur word.

A. E. Hardenberg
Persooneelbestuurder

Posbus 450
Pretoria
22 September 1952

Transvaalse Provinsiale Administrasie

VAKATURES BY PUBLIEKE HOSPITALE

Aansoeke word ingewag van kandidate met geskikte kwalifikasies vir die onderstaande poste by Publieke Hospitale in die Transvaal.

Aansoeke moet gerig word aan die Geneeskundige Superintendent en Verantwoordelike Geneesheer van die betrokke Hospitaal en moet volle besonderhede bevat aangaande die ouderdom, professionele, akademiese en taalkwalifikasies, ondervinding en huwelikstaat van die applikant en moet voorts 'n aanduiding bevat van die vroegste datum waarop diens aanvaar kan word:—

Lewenskostetoelae tans betaalbaar aan voltydse werknemers:—

Salaris	*Lewenskostetoelae*	
	Getroud	*Ongetroud*
Oor £350	£320 p.j.	£100 p.j.

Van persone wat aangestel word, sal verwag word om bevredigende sertifikate in te dien, asook om hulle te onderwerp aan 'n geneeskundige ondersoek by die betrokke hospitaal.

Aansoek vorms is verkrygbaar van enige Transvaalse Publieke Hospitaal of die Provinsiale Sekretaris, Afdeling Hospitaaldienste, Posbus 2060, Pretoria.

Benewens jaarlikse salaris en lewenskostetoelae ontvang voltydse werknemers spoorwegkonsessie en word verlof toegestaan ooreenkomstig die hospitaal verlofregulasies.

Die sluitingsdatum van aansoeke vir die poste is 20 Oktober 1952.

Hospitaal	*Vakatures*	*Emolumente*	*Opmerkings*
Johannesburgse Hospitaalbestuur en die Universiteit van die Witwatersrand:			
Johannesburg:	Voltydse Ortopediese Chirurg (1)	£1,800	Geregistreerde mediese praktisyn. Hoër kwalifikasies en ondervinding in ortopediese chirurgie 'n vereiste.
	Voltydse Radioloë (2)	£1,800	Geregistreerde mediese praktisyn. Hoër kwalifikasies en ondervinding in radiologie 'n vereiste.
	Voltydse Assistent Radioloë (4)	£1,200x50–1,500	Geregistreerde mediese praktisyn. Hoër kwalifikasies en ondervinding in radiologie 'n aanbeveling.
	Voltydse Assistent Radiotherapeut (1)	£1,200x50–1,500	Geregistreerde mediese praktisyn. Hoër kwalifikasies en ondervinding in radiotherapie 'n aanbeveling.
	Voltydse Assistent Chirurgiese beampte (1)	£620–900x40–1,020	Geregistreerde mediese praktisyn. Moet vir ten minste twee jaar gekwalifiseerd wees.
	Voltydse Ongevallebeamptes(11)	£620, 780, 820, 860	Geregistreerde mediese praktisyn. Moet vir ten minste twee jaar gekwalifiseerd wees.
	Voltydse Registrateur (Departement van Ortopedie) (1)	£620, 780, 820, 860	Geregistreerde mediese praktisyn. Moet vir ten minste twee jaar gekwalifiseerd wees.
	Voltydse Registrateur (1) (Departement van Narkose)	£620, 780, 820, 860	Geregistreerde mediese praktisyn. Moet vir ten minste twee jaar gekwalifiseerd wees.
Barberton:	Verantwoordelike Geneesheer (1)	£1,000x50–1,200	Geregistreerde mediese praktisyn. Plus £180 per jaar huistoelae.
Krugersdorp:	Kliniese Assistent (Departement van Chirurgie) (1)	£620, 780 820, 860	Geregistreerde mediese praktisyn. Moet taamlik ondervinding in algemene praktyk gehad het.
Pretoria:	Junior Ginekoloog en Verloskundige (1)	£1,200x50–1,500	Geregistreerde mediese praktisyn. Moet behoorlik deur opleiding en ondervinding gekwalifiseerd wees.

37383

Winburg Municipality

VACANCY: PART-TIME MEDICAL OFFICER OF HEALTH

Applications are hereby invited for the abovementioned post within the Municipal area of Winburg and including services at the local venereal diseases Clinic. The salary attached to the post is £180 per annum.

The proposed agreement to be signed by the successful applicant, will lie for inspection in the office of the undersigned and the appointment is subject to the approval of the Minister of Public Health.

Applications stating age, qualifications and experience, must reach the undersigned not later than Monday, 20 October 1952, at 4 p.m.

T. I. F. Grobbelaar
Town Clerk

Municipal Offices
Winburg O.F.S.
11 September 1952

Winburg Munisipaliteit

VAKATURE: DEELTYDSE MEDIESE GESONDHEIDSBEAMPTE

Applikasies word hierby ingewag vir bogenoemde pos binne die Munisipale gebied van Winburg en insluitende dienste by die plaaslike veneriese siekte Kliniek. Die salaris aan die pos verbonde is £180 per jaar.

Die voorgestelde ooreenkoms wat deur die suksesvolle applikant geteken moet word, lê ter insae op kantoor van ondergetekende en die aanstelling is onderhewig aan die goedkeuring van die Minister van Volksgesondheid.

Applikasies waarin ouderdom, kwalifikasies en ondervinding gemeld word, moet die ondergetekende nie later as Maandag, 20 Oktober 1952 om 4 uur nm. bereik nie.

T. I. F. Grobbelaar
Stadsklerk

Munisipale Kantore
Winburg O.V.S.
11 September 1952

Natal Provincial Administration

VACANCIES: VISITING ORTHOPAEDIC STAFF: KING EDWARD VIII HOSPITAL, DURBAN

Visiting Orthopaedic Surgeon. Inclusive emoluments: £750 per annum. Temporary Assistant Visiting Orthopaedic Surgeon. Inclusive emoluments: £400 per annum.

Canvassing of members of any Provincial or Hospital Committee will disqualify candidates.

Applications should reach the Director, Provincial Medical and Health Services, P.O. Box 20, Pietermaritzburg, by 31 October 1952. 7232

Locum Wanted

Locum for district surgeonry and private practice in Maltahoehe, South West Africa. Because of illness, wanted urgently and immediately for 8 to 10 months. Conditions: equal share for both of income after deduction of practice expenses. Write 'A. N. E.', P.O. Box 643, Cape Town.

Provincial Administration of the Cape of Good Hope

HOSPITALS DEPARTMENT

HOSPITAL BOARD SERVICE: VACANCIES

Applications are invited for the undermentioned vacant posts in the Hospital Board Service.

The appointment of the successful candidates will be made in terms of, and be subject to, the Hospital Board Service Ordinance, 1941 (Ordinance No. 19 of 1941) and the regulations framed thereunder.

In addition to the emoluments specified hereunder, cost-of-living allowance is payable to whole-time officials and employees.

Applications should be submitted (in duplicate) on the prescribed form Staff 23, which is obtainable from the Director of Hospital Services, P.O. 2060, Provincial Building, Wale Street, Cape Town, or from the Branch Representative, of the Hospital Department at Cape Town (P.O. Box 1487), Port Elizabeth (P.O. Box 80), East London (P.O. Box 13), Kimberley (P.O. Box 618), and Umtata (P.O. Box 202), or from the Medical Superintendent of any Provincial Hospital or Secretary of any School Board in the Cape Province.

The closing date for the receipt of applications is 31 October 1952 and applications should be addressed to the Branch Representative, Hospitals Department, P.O. Box 1487, Cape Town.

Institution	*Post*	*Emoluments*
Cape Town Free Dispensary	Medical Practitioner Grade "A"	£500–600–660–£720 per annum

The contract will be for a period of two years and the Administration reserves the right to extend the period for a further two years. (36324)

University of Natal

(PIETERMARITZBURG AND DURBAN)

PART-TIME ASSISTANTSHIPS: DEPARTMENT OF ANATOMY, FACULTY OF MEDICINE, DURBAN

Applications are invited from registered medical practitioners for part-time assistantships in the Department of Anatomy, Faculty of Medicine, at Durban. The duties involved will be to assist the whole-time Professor of Anatomy as he may direct. Remuneration will be on the basis of £2 5s. per session (morning or afternoon, 3 hours duration). No one assistant will be required for more than five sessions weekly. Further details may be obtained on application to the Professor of Anatomy, P.O. Box 1525 or telephone 877417, Durban.

The closing date for applications is 31 October 1952, and should be made to the Professor of Anatomy, Faculty of Medicine, P.O. Box 1525, Durban.

Medical Officer Required

Applications are invited for the post of part-time medical officer to the United Tobacco Cos. (South) Ltd., Factory at Hamilton, Bloemfontein. Applicants should state the services they would render to employees which must include daily attendance at Factory and pre-employment examinations. Reply in first instance to P.O. Box 391, Bloemfontein.

Before submitting applications for this post, practitioners are advised to communicate with the Hon. Secretary, O.F.S. and Basutoland Branch (M.A.S.A.), P.O. Box 834, Bloemfontein. 3073

Te Koop

O.V.S. praktyk. Medisyne word aangemaak. Inkomste £2,400 per jaar. Goeie kanse vir uitbreiding. Premie vir klandisiewaarde, medisyne voorraad en spreekkamermeubels, £1,000. Terme kan gereël word. Skryf aan „A.N.G.", Posbus 643, Kaapstad.

Iscor Medical Benefit Fund

FULL-TIME DENTAL OFFICER

Applications are invited from suitably qualified dentists for the above position.

The successful applicant will be required to submit a satisfactory certificate of health and the appointment will be subject to the Fund's general conditions of service, leave regulations, etc.

The commencing salary will vary between £1,200 and £1,650 per annum, according to ability and experience. In addition a cost of living allowance is payable.

Applications must be received on or before 27 October 1952.

Application forms, together with full particulars, will be forwarded to *bona fide* applicants on written application to the undersigned.

Q. S. van Castricum
General Secretary

P.O. Box 450
Pretoria
15 September 1952

Yskor Mediese Bystandsfonds

VOLTYDSE TANDHEELKUNDIGE BEAMPTE

Aansoeke om bogemelde pos word van paslike gekwalifiseerde tandartse ingewag.

Van die suksesvolle applikant sal verwag word om 'n bevredigende gesondheidssertifikaat in te dien, en die aanstelling sal aan die Fonds se algemene diensvoorwaardes, verlofregulasies, ens., onderworpe wees.

Die aanvangsalaris sal varieer tussen £1,200 en £1,650 per jaar, volgens bevoegdheid en ondervinding. Lewensduurte toeslag word boonop betaal.

Aansoeke moet voor of op 27 Oktober 1952 ontvang word.

Aansoekvorms en volledige besonderhede sal op skriftelike aansoek by ondergetekende aan *bona fide* applikante gestuur word.

Q. S. van Castricum
Algemene Sekretaris

Posbus 450
Pretoria
15 September 1952

Basutoland Government

VACANCY FOR MEDICAL OFFICER

Applications are invited from registered medical practitioners for the above post, on a salary scale of £865—£865—£935 × 35 —£1,005 × 45—£1,140 × 45—£1,320 per annum. In determining an officer's point of entry into this scale credit may be given for war service and previous experience. Cost-of-living allowance is payable and at present the rates are as follows:

Married rates: On the first £800 of salary 12½%; on the remaining salary 7½% with a maximum of £132 per annum.

Single rates: One half of the above rates subject to a maximum of £66 per annum.

These rates are subject to alteration from time to time. Furnished quarters are provided by Government for which there is a rental deduction from salary of 10%. Annual vacation (cumulative) leave of six weeks and two weeks occasional (non-cumulative) leave are granted subject to the exigencies of the service. The post is pensionable after a probationary period of two years.

For further particulars and application form apply to the Director of Medical Services, Maseru, Basutoland. 536

Locum Required

Locum tenens required for Umtali, Southern Rhodesia, for the period 15 December 1952 to 31 January 1953. £2 12s. 6d. per day, board and lodging provided. Own car essential but petrol, oil and service provided. Allowance for travelling expenses. Write 'A. N. H.', P. O. Box 643, Cape Town.

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